5. OTHER COVERED SPECIES

This section, together with *Section 6*, *Potential Biological Impacts/Take Assessment*, and *Section 7*, *Conservation Plan for Other Covered Species*, provides a complete analysis of the 26 Other Covered Species. This introduction summarizes the content of each section along with the linkages between them.

This section focuses on the natural history of each of the 26 species, including status, distribution, and habitat characteristics, along with literature sources. Specific information is provided regarding the occurrence of the species within Covered Lands, along with the regulatory setting and listing status for each species. This section also summarizes the data and data sources used for the analysis of the 26 Other Covered Species, including data on vegetation communities, species occurrences, water features and drainages, topography, soils, and imagery. For this Tehachapi Uplands Multiple Species Habitat Conservation Plan (TU MSHCP), a model was developed for each of the 26 Other Covered Species to identify and map suitable habitat for the species within Covered Lands using relevant available data. This section summarizes the habitat suitability analysis process, and references *Appendix D* to the TU MSHCP, where a detailed documentation of the model inputs for each species is provided. Maps depicting the model outputs for each species are presented in this section.

Section 6 provides the take analysis and impact assessment for each of the 20 other wildlife Covered Species based on the project description and description of Covered Activities included in *Section 2, Plan Description and Activities Covered by Permit*. Since incidental take for the six covered plants is not provided for in the TU MSHCP, rather than an impact analysis and take assessment, *Section 6* describes the effects to plant Covered Species associated with implementation of the TU MSHCP Covered Activities. The impact assessments for the 26 Other Covered Species in this section are both quantitative and qualitative, and a description of the methods used for the impact assessment is included. For the 20 wildlife Other Covered Species, the take assessments first quantify the effects of Covered Activities with respect to reduction or loss of modeled suitable habitat; then available information regarding the size of territories or home ranges is used, as appropriate for a particular Covered Species, to estimate the number of individuals a modeled habitat acreage may support, assuming the modeled habitat is uniformly and fully saturated (e.g., at carrying capacity). This sets the theoretical upper end of the population size in the modeled habitat. This high-end estimate is then revised downward based on the fact that modeled habitat is highly unlikely to be saturated (i.e., based on site-specific surveys showing scattered and/or low-density populations) and other species-specific factors (e.g., concentrations in microhabitat). The revised estimate is the basis for estimating the actual number of individuals, breeding territories, etc., that would be lost prior to, and after implementation of avoidance and minimization measures. For several species, the best estimate that can be made is the loss of a small, but indeterminable number of individuals (e.g., salamanders). The impacts of the take analyses include a summary of the status and distribution of the species within its range, a summary of the loss and conservation of the species expected to occur with implementation of the

TU MSHCP, and a conclusion regarding the overall impacts of the take associated with the TU MSHCP on the species as a whole. The assessment includes implementation of conservation and avoidance and minimization measures described in greater detail in *Section 7*.

Section 7 presents the conservation plan proposed to be implemented as part of the TU MSHCP, along with the avoidance, minimization, and mitigation measures incorporated in the conservation plan to offset the effects analyzed in *Section 6*. *Section 7* states conservation goals and objectives for each of the 26 Other Covered Species, including goals for conservation of suitable habitat and management of threats to the species. Avoidance, minimization, and mitigation measures are described. The primary feature of the TU MSHCP to avoid, minimize, and mitigate impacts to Covered Species is the conservation of about 91% of Covered Lands within open space. This feature of the plan is described in *Sections 2* and *7* of the TU MSHCP. Monitoring, management, adaptive management, and reporting measures incorporated in the TU MSHCP are described in this section as part of the overall conservation plan. This section also describes the ways in which take will be measured during implementation of the TU MSHCP in terms of habitat loss, the rationale for use of habitat loss as a measurement for take, and specific quantification of the take authorized by the TU MSHCP.

5.1 METHODS USED TO ANALYZE POTENTIAL BIOLOGICAL IMPACTS TO OTHER COVERED SPECIES

Appendix D describes the database documenting the physical characteristics and biological resources of the Covered Lands that was used to inform the planning process and analyze the effects and impacts to Covered Species, the quantitative and qualitative methods used in the analysis, the anticipated impacts on the Covered Species, and the effects of the impacts on the Covered Species.

Data

A comprehensive biological and physical database is available for the Covered Lands and was used in the development of the TU MSHCP. This database includes orthorectified aerial imagery and digital information for vegetation communities, species occurrences, wetlands and drainages, topography, elevation, slope, and soils. *Appendix D* describes each of these data sets in more detail and how the data were used to develop the suitable habitat models. Also included in *Appendix D* is the complete list of model input parameters for each of the 26 Other Covered Species addressed in this section.

Vegetation Communities

The Covered Lands vegetation map is included as *Figure 5-1, Covered Lands Vegetation Map*. This map was prepared by geographic information systems (GIS) staff at Tejon Ranchcorp (TRC) and its consulting biologists. Two primary data sources were combined to form this map: (1) the Tejon Ranch–wide vegetation composite map, and (2) the vegetation map created for the Tehachapi Mountain Uplands during site-specific studies in 2007. Additional information on these two data sources is provided in *Appendix D*.

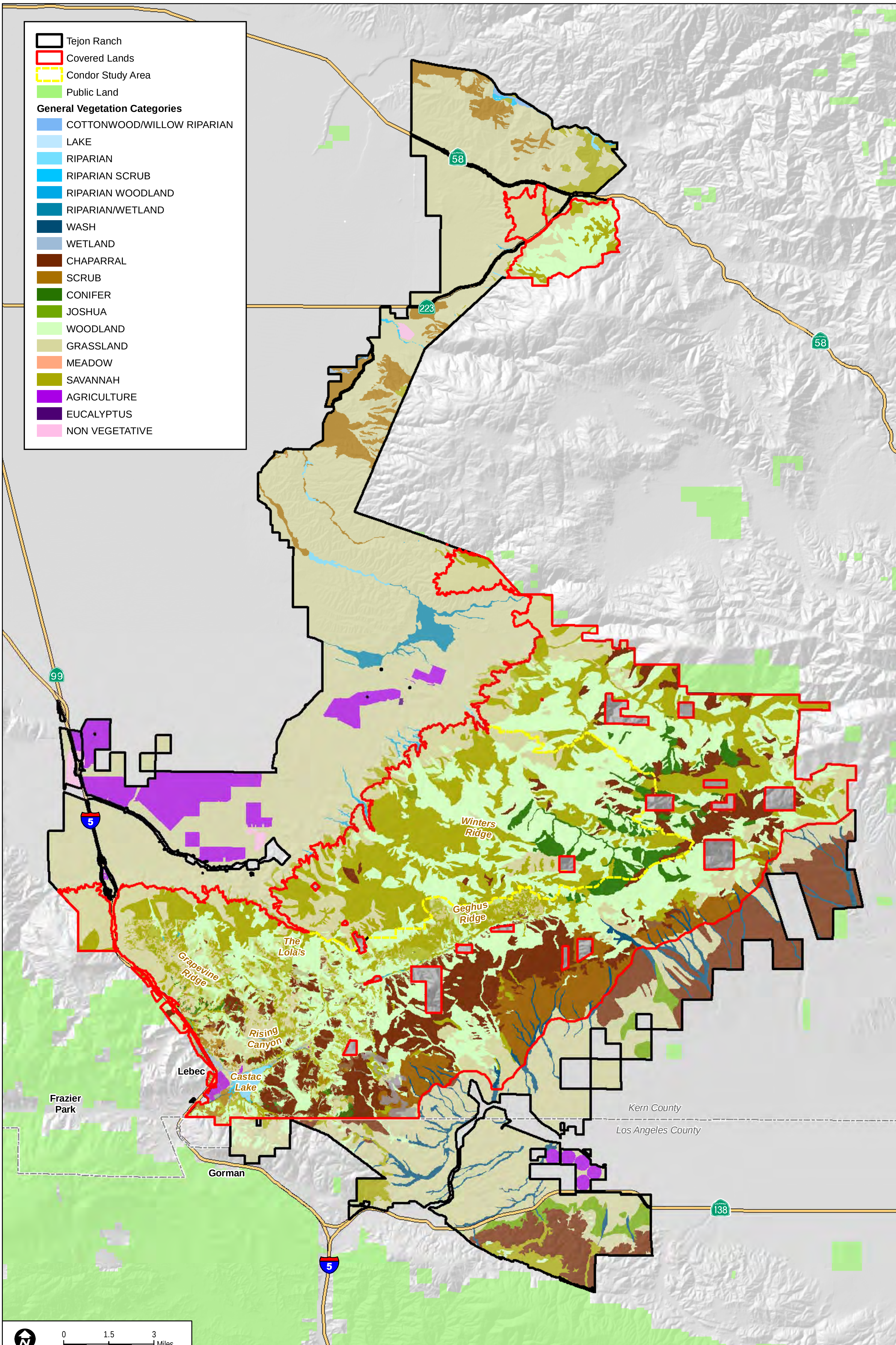

FIGURE 5-1

Covered Lands Vegetation Map

Draft Tehachapi Uplands MSHCP

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Species Occurrence Data

Species occurrence data were reviewed and used to develop various sections of this TU MSHCP that require an understanding of the general distribution and relative abundance of species covered in the plan. Two primary sources of spatial (GIS-based) data were used: (1) species occurrence data collected during various surveys in portions of the Covered Lands (Dudek 2009), and (2) California Natural Diversity Database (CNDDB) occurrence data (CDFG 2011a). Further information on these two data sets is provided in *Appendix D*.

Two non-spatial (GIS-based) resources related to species occurrences were also used to determine general distribution patterns, including geographic and elevation ranges, of the species covered in the plan: (1) the California Native Plant Society (CNPS) online inventory (CNPS 2007), and (2) the California Department of Fish and Game's (CDFG's) *Life History Accounts and Range Maps—California Wildlife Habitat Relationships System* (CDFG 2007d).

Additional scientific literature and related information reviewed are provided in *Appendix D* of this report and are organized by taxon. Additional occurrence data or range maps were reviewed for individual species and the citations are included in the species accounts in this section and in *Section 4*, *California Condor*.

Water Features and Drainages

Five primary data layers related to water features and drainages were used in the development of a number of the TU MSHCP suitable habitat models. *Appendix D* describes these data sources in more detail.

Digital Terrain Model

An important component of the physical database for this TU MSHCP is the digital terrain model developed by Intermap Technologies (Intermap Technologies 2005). The digital terrain model allows GIS technicians to develop elevation and slope models that are used as components of the suitable habitat modeling for certain species covered in this TU MSHCP. Additional information on the digital terrain model and its use in suitable habitat modeling is available in *Appendix D*.

Soils

Mapping and analysis of the soils data utilized the Soil Survey Geographic database, which was created by digitizing the 1981 soil survey map and is the most detailed level of soil geographic data developed by the National Cooperative Soil Survey (USDA 1999). Digital soils data enabled quantitative analysis of soils considered important for modeling suitable habitat and the conservation of certain plant species. However, the soils data are spatially limited in their extent in the Covered Lands because the mapping does not extend to roughly the western quarter of the

Covered Lands. There are 66 different soil types mapped in the Covered Lands. The digitized soils data layer is depicted in *Figure 5-2, Covered Lands Soils Map*. Additional information on soils mapping within Covered Lands is included in *Appendix D.*

Imagery

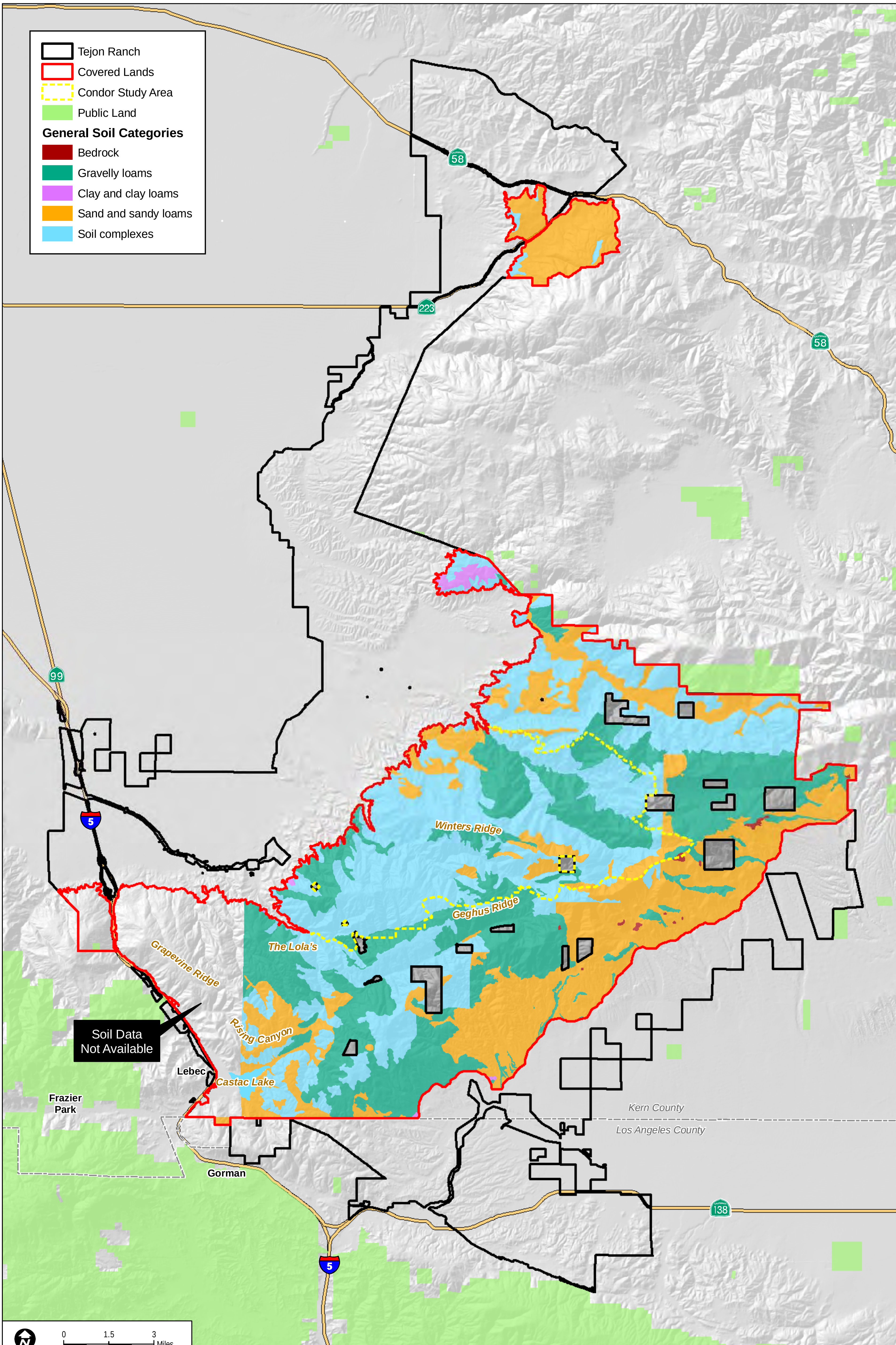
Two primary sources of image data were used in developing the TU MSHCP: (1) geo-referenced U.S. Geological Survey (USGS) topographic quadrangle maps; and (2) full-color aerial images for a portion of the Covered Lands. For the Tehachapi Mountain Uplands, full-color aerial photographs taken in June 2006 were obtained from AirPhotoUSA (2006). Additional information on aerial imagery used in the TU MSHCP is provided in *Appendix D.*

Habitat Suitability Analysis

The data described above in this section were used, as applicable, to generate suitable habitat models for each of the Covered Species in the TU MSHCP. Model data and input parameters used for each species varied depending on the unique habitat requirements of each species. Biologists familiar with the Covered Species reviewed the scientific literature (see *Section 4* and Sections 5.2 and 5.3 for specific literature pertaining to each species) and determined model input parameters uniquely suited to each species. A biology working group peer-reviewed these initial model input parameters, and revisions were made where improvements or adjustments were deemed necessary. A complete list of data and input parameters for each of the Covered Species suitable habitat models is provided in *Appendix D.*

Literature

A wide array of literature was reviewed and used for the analysis presented in this section. Literature citations for the species accounts are provided for each of the species in *Section 4* and Sections 5.2 and 5.3, but are also included in the section where appropriate to support the analysis. A large body of scientific literature was reviewed, but only literature cited in the text is included in *Section 11, Literature Cited*.



SOURCE: California Department of Conservation 2007
California Resource Agency 2011
TRC 2007

FIGURE 5-2
Covered Lands Soils Map

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5.2 WILDLIFE

5.2.1 AMPHIBIANS

5.2.1.1 TEHACHAPI SLENDER SALAMANDER

The current description of the Tehachapi slender salamander (*Batrachoseps stebbinsi*) as a distinct species is relatively recent (Brame and Murray 1968). The taxonomy of Tehachapi slender salamander, however, is uncertain, and there is some evidence that Tehachapi slender salamander populations may represent two species. The existence of two species of *Batrachoseps* in the Tehachapi Mountains (in addition to the black-bellied salamander [*B. nigriventris*]) may have been recognized as early as 1858 (Wake and Jockusch 2000). Genetic work on speciation in *Batrachoseps* indicates a complex pattern of separation and contact among different species, which complicates the taxonomy of the genus. Wake and Jockusch (2000) examined the mitochondrial DNA gene cytochrome b for all 18 *Batrachoseps* species and several undescribed species and found that populations were more isolated in the past than they are now, indicating that there was some speciation occurring while separated. The recent contact and merging by male-mediated gene flow is confounding the genetic analysis. Hansen and Wake (2005) suggested that the two populations centered in the Caliente Creek area and in the Tehachapi Mountains may represent two distinct species based on differences in genetics, size, and coloration. However, in the recent 12-Month Finding of whether Tehachapi slender salamander should be Federally listed as threatened, the U.S. Fish and Wildlife Service (USFWS) evaluated the most recent available genetic and morphological information about differences between the two populations. USFWS's review included a personal communication with Hansen, who currently believes that there are insufficient differences between the two populations to classify them as separate species or subspecies (76 FR 62900–62926). Based on this review, USFWS concluded that the two populations of Tehachapi slender salamanders should be treated as a single species at this time. For the 12-Month Finding, USFWS assigned the Caliente Canyon and Tehachapi Mountains populations to two Distinct Population Segments (DPS): the Tehachapi Mountains DPS and the Caliente Canyon DPS, which together constitute the entire range of the species (76 FR 62900–62926).

The Tehachapi slender salamander is a relatively large and robust slender salamander that grows to approximately 3.5 to 5 inches in length (CaliforniaHerps 2011). Female Tehachapi slender salamanders are slightly larger than males (Brame and Murray 1968). The species is distinguished by its relatively broad head, long and robust legs, short tail, and broad and long toes (CaliforniaHerps 2011; Hansen and Wake, pers. comm. 2008). Unlike other California salamanders, which have five toes, *Batrachoseps* has four toes on both its front and hind feet. The sympatric and more common black-bellied salamander is differentiated from the Tehachapi slender salamander by having a more narrow head, smaller eyes, shorter legs, longer tail, and more fused toes (Hansen and Wake, pers. comm. 2008). The Tehachapi slender salamander is reddish or brownish with light beige, tan, or black blotches forming an indistinct dorsal stripe with uneven edges (CaliforniaHerps 2011).

5.2.1.1.1 STATUS AND DISTRIBUTION

Regulatory History

The Tehachapi slender salamander was listed by the State of California as threatened in 1971 but currently is not Federally listed as threatened or endangered (CDFG 2008a). USFWS recently completed its 12-Month Finding to determine whether it should be Federally listed as threatened and concluded, based on the available scientific and commercial literature, that a listing as threatened was not warranted (76 FR 62900–62926).

Natural History

Although the Tehachapi slender salamander's specific feeding habits are unknown, related species feed on small arthropods, such as spiders and mites, insects (especially collembolans, coleopterans, and hymenopterans), earthworms, and snails (Cunningham 1960; Adams 1968). *Batrachoseps* are generally sit-and-wait predators (CaliforniaHerps 2011); they search or wait for small insects and other invertebrates under surface objects (USFS 2006a). It is assumed that the Tehachapi slender salamander, like all *Batrachoseps* species observed thus far, capture small invertebrates using a projectile tongue (AmphibiaWeb 2008). As a semi-fossorial[1] species, the Tehachapi slender salamander is able to enter termite tunnels, earthworm burrows, and other small openings not accessible to larger salamanders. They may compete with juvenile salamanders of other species where their ranges overlap (Morey 2005).

The activity patterns of the Tehachapi slender salamander are largely dependent upon temperature range and precipitation patterns, which are erratic in both timing and amount within the species' range (Hansen and Wake 2005; AmphibiaWeb 2008). Surface activity closely correlates with the onset of the rainy season, which generally occurs around November or December (AmphibiaWeb 2008). At lower elevations, this rainy season may be rather brief (2 to 3 months) (AmphibiaWeb 2008). Due to the relative dryness of its habitat, the Tehachapi slender salamander may have a shorter activity period than other slender salamanders (CaliforniaHerps 2011). During the moist period (November to May), the Tehachapi slender salamander can be found nocturnally active on the surface, although periods of surface activity vary from year to year (Morey 2005). March and April generally mark the salamander's peak surface activity, although it can extend into May in wet years or at higher elevations (e.g., the upper reaches of the Pastoria Creek and Tejon Creek drainages in the Tehachapi Mountains) (Hansen and Wake, pers. comm. 2008; AmphibiaWeb 2008). During drier periods, salamanders retreat underground to moist seepages (Morey 2005). In years of below-average rainfall or consecutive years of

[1] "Semi-fossorial" means burrowing part of the time (Allaby 1998).

drought, salamanders may not appear under surface cover at all, but rather retreat to subterranean refugia (Morey 2005; AmphibiaWeb 2008).

Most of the Tehachapi slender salamander's range experiences below-freezing temperatures during the winter. At this time, salamanders are rarely found under surface cover and are likely underground (AmphibiaWeb 2008).

Reproduction is terrestrial (AmphibiaWeb 2008). Eggs are laid in moist places under surface objects and hatch fully formed (USFS 2006a; CaliforniaHerps 2011). Breeding season is suspected to be from November to February, with peak activity in November and December. The Tehachapi slender salamander probably lays eggs during the rainy periods of winter and early spring (Morey 2005). Clutch size remains unknown, although related forms lay eggs in clusters of four to 21 (USFS 2006a; Stebbins 1954). Unlike the California slender salamander (*B. attenuatus*), extensive surface movements within the breeding season seem unlikely given that most populations are associated with small, discrete patches of suitable habitat (Anderson 1960).

Although nest sites have not been directly observed, eggs are likely deposited deep within the rock talus and litter matrix typical of Tehachapi slender salamander microhabitat. Tehachapi slender salamanders may build communal nests, as has been reported for the black-bellied salamander (Jockusch and Mahoney 1997).

The Tehachapi slender salamander is not thought to be territorial (USFS 2006a); however, females of related species are often found in the immediate vicinity of egg clusters (Morey 2005). Tehachapi slender salamander home ranges are likely small and have been estimated to be approximately 0.5 acre (USFS 2006a). Based on an unpublished communication to USFWS from Hansen and literature on the black-bellied salamander, USFWS suggests that individuals may remain within approximately 3 meters (10 feet) during their lifetime, depending on climate conditions (76 FR 62900–62926). In any case, this species likely is highly sedentary and unlikely to move long distances from breeding sites due to its dependence on moist habitats and rocky substrates. The area of Tehachapi slender salamander surface activity probably covers its area of underground activity (Morey 2005). In similar *Batrachoseps* species, up to 15 individual territories have been located within a 10-meter by 10-meter area (Hansen and Wake, pers. comm. 2008).

Tehachapi slender salamanders and yellow-blotched salamanders (*Ensatina eschscholtzii croceater*) are the only salamanders known to be present in Caliente Canyon, although black-bellied slender salamanders and possibly gregarious slender salamanders (*B. gregarius*) are believed to occur nearby (AmphibiaWeb 2008). Within the Tehachapi Mountains, Tehachapi slender salamanders and black-bellied slender salamanders are sympatric[2] in the Pastoria Creek

[2] "Sympatric" refers to occupation of the same geographical area and, in the context of this species, it refers to occupation of the same drainage or creek.

and Tejon Creek drainages, at Fort Tejon in Grapevine Canyon, and possibly elsewhere (Jockusch 1996; Wake and Jockusch 2000) but do not hybridize (Hansen and Wake, pers. comm. 2008). Tehachapi slender salamanders are habitat specialists, whereas black-bellied slender salamanders occupy a broader distribution. The sympatric relationship between these two species is the only case of sympatry involving members of the same species group of *Batrachoseps* (Wake and Jockusch 2000).

Primary predators of the Tehachapi slender salamander are most likely small snakes, such as the ringneck snake (*Diadophis punctatus*). Other potential predators of both adults and juveniles include beetle larvae and other predatory arthropods, diurnal birds (especially birds that forage through leaf litter), and small mammals (Morey 2005). Hansen and Wake (pers. comm. 2008) believe that feral pigs are a predator of Tehachapi slender salamander where the species co-occur. Typical Tehachapi slender salamander defensive behaviors may include coiling, immobility (cryptic behavior),[3] rapid crawling, and tail autonomy[4] (CaliforniaHerps 2011; AmphibiaWeb 2008). When *Batrachoseps* species are disturbed, they may coil up and remain still, then uncoil rapidly and spring away, repeatedly bouncing over the ground.

Distribution and Population Trends

The population trends of the Tehachapi slender salamander are unknown, but there are reports on observed occurrences that allow for a characterization of the species' general range and distribution. The Tehachapi slender salamander is endemic to California and occurs only in Kern County from approximately 1,800 to 4,825 feet above mean sea level (amsl) (76 FR 62900–62926).

The Tehachapi slender salamander can be found in the Caliente Creek drainage in the Piute Mountains as well as through the Tehachapi Mountains to Fort Tejon (CaliforniaHerps 2011).

Tehachapi slender salamanders are known from two small areas in Kern County. In Caliente Canyon and several tributary canyons outside of Covered Lands, and at the junction of the Sierra Nevada and Tehachapi Mountains, Tehachapi slender salamanders have been recorded from 18 localities at elevations of 550 meters to 1,471 meters (1,804 to 4,825 feet amsl) (CDFG 2011a; Brame and Murray 1968; AmphibiaWeb 2008). Tehachapi slender salamander populations also occur in several isolated canyons on the northern slopes of the Tehachapi Mountains, ranging from Tejon Canyon southwest to Fort Tejon, at elevations of 945 meters to 1,430 meters (3,100 to 4,692 feet amsl) (Yanev 1980; Stebbins 1985; Jockusch 1996; Wake 1996; Wake and Jockusch 2000; AmphibiaWeb 2008). In 1957, a specimen was found from the north slope of Black Mountain (914 meters or 2,998 feet amsl) in the vicinity of Tehachapi Pass, between the Tehachapi Mountains and Caliente Canyon populations (Brame and Murray 1968).

[3] "Cryptic behavior" refers to the means of an organism to avoid detection, often through action, camouflage, nocturnality, subterranean lifestyle, transparency, or mimicry.
[4] The tail readily breaks off, but can be regenerated.

Reasons for Decline

Tehachapi slender salamander populations are restricted to talus within seasonally shaded, north-facing (0 to 90 degrees and 0 to 270 degrees) slopes of canyons located in otherwise arid to semi-arid terrain. The small and localized nature of these populations, which occur at a limited number of sites, makes them highly susceptible to habitat disturbance caused by development. Tehachapi slender salamander habitat is potentially threatened by feral pigs, road construction, mining, residential and commercial development, logging, cattle grazing, and flood control projects (Hansen and Stafford 1994; Jennings 1996; Hansen and Wake 2005).

5.2.1.1.2 HABITAT CHARACTERISTICS AND USE

The Tehachapi slender salamander inhabits moist canyons and ravines in oak and mixed woodlands (CaliforniaHerps 2011). Hansen and Wake (pers. comm. 2008) indicate that Tehachapi slender salamander occurs on north-facing slopes within talus piles, where canyon live oak occurs. The habitat is also defined by Morey (2005) as including valley–foothill, hardwood–conifer, and valley–foothill riparian habitats (Morey 2005) and by the U.S. Forest Service (USFS) as including all stages of blue oak savannah, gray pine–oak woodland, riparian deciduous habitat types, mountain meadow, and all successional stages of mixed conifer forest (USFS 2006a). However, according to Hansen and Wake (pers. comm. 2008), Tehachapi slender salamander has been found only when canyon live oak is a component of the vegetative cover (Hansen and Wake, pers. comm. 2008). During the moist periods of fall, winter, and spring precipitation, individuals seek cover under surface objects, especially rock talus (Brame and Murray 1968). Other substrates that may be used for cover include rocks, logs, bark, and other debris in moist areas, especially in areas with much leaf litter (CaliforniaHerps 2011), but they are primarily associated with talus (Hansen and Wake, pers. comm. 2008). Recently, the species was documented for the first time in dead yuccas (*Yucca* spp.) on north-facing slopes (Sweet 2011). The decomposing leaf bases may hold water from snowmelt for a considerable period of time, providing a suitable moist microhabitat for the species; one such dead yucca supported 20 individuals (Sweet 2011).

Along Caliente Creek, Tehachapi slender salamanders are restricted to the lower margins of north-facing slopes bordering the creek and a few small side canyons. They are associated with granitic or limestone talus and scattered rocks. Gray pine (*Pinus sabiniana*), interior live oak, canyon live oak, blue oak, Fremont cottonwood, sycamores (*Platanus* spp.), and California buckeye (*Aesculus californica*) can be found in this area (Brame and Murray 1968). California juniper (*Juniperus californica*), yucca, bush lupine (*Lupinus* spp.), and buckwheat (*Eriogonum* spp.) grow at more exposed locations where Tehachapi slender salamanders are found in Caliente Creek. Substrates range from sandy–gravelly loam to decomposed granite (AmphibiaWeb 2008). At the higher elevations of the canyons of the Tehachapi Mountains, Tehachapi slender salamanders occur in areas of downed wood or talus rather than the rocks of the Caliente Creek populations (AmphibiaWeb 2008).

The Tehachapi slender salamander primarily forages under surface objects, such as pieces of bark or flat talus rocks, in moist areas, or in leaf litter. Tehachapi slender salamanders may enter termite tunnels and earthworm burrows when foraging (Morey 2005).

Specific habitat requirements for breeding or egg-laying for this species are not well documented. Similar species lay their eggs underground or on moist substrates underneath or within surface objects, especially pieces of bark (Stebbins 1972).

It is unknown how juvenile Tehachapi slender salamander habitat differs from that of adults. However, juveniles are rarely found. This may indicate that hatching occurs in the spring as surface activity declines and that juveniles may remain underground (AmphibiaWeb 2008) until the following rainy season.

5.2.1.1.3 OCCURRENCE IN THE COVERED LANDS

Surveys for Tehachapi slender salamander were conducted in the TMV Planning Area in four phases by Jones and Stokes biologists. The first phase occurred in April and June 2005 and consisted of initial reconnaissance-level surveys for Tehachapi slender salamander to: (1) assess potential on-site suitable habitat, and (2) determine if the species could be detected during April through June. The second phase of surveys was conducted in March 2007 to assess the suitability of habitat for Tehachapi slender salamander in additional drainages that were not surveyed in 2005 and 2006. The third phase included focused surveys in May 2007 of approximately 77 drainages identified in earlier surveys to determine if these locations were occupied by the species. These focused surveys concentrated on areas located 20 feet on either side of the streambed where soils generally remain moist for the longest period during the summer. The fourth phase was conducted in July, August, and September 2007, and consisted of supplementary field habitat assessments in several additional drainages. An additional habitat assessment and focused survey for Tehachapi slender salamander was conducted by ICF (formerly Jones and Stokes) in the Beartrap Turnout Improvement Project study area in May 2008, but no suitable habitat was observed (Kohn, pers. comm. 2008a, 2008b). See *Appendix D.1* for more detailed information on survey methods.

During field surveys, Tehachapi slender salamander was observed only in the TMV Planning Area in Monroe Canyon, which is located within TMV Planning Area Open Space. The salamander was observed in a moist drainage with leaf litter, talus, and live oak. No positive detections were made in the other 76 drainages that were surveyed (Jones and Stokes 2008a). However, there are four CNDDB occurrences of Tehachapi slender salamander on the Covered Lands, including two in Beartrap Canyon, one in a drainage adjacent to the California Aqueduct, and one in Tejon Canyon in the northeastern section of the southern portion of the Covered Lands.

Suitable habitat for the Tehachapi slender salamander was modeled for Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitat on Covered Lands consists of broad-leafed upland tree-dominated communities, coniferous upland forest and woodland communities, scrub communities, chaparral communities, and scrub oak with a canopy cover greater than 40% that also meet all of the following criteria: (1) within 150 feet on either side of a blue-line stream (TRC 2002), (2) on north-facing slopes, and (3) at elevations between 1,900 feet and 5,000 feet (Zeiner et al. 1988). The modeled habitat includes communities on the Covered Lands that contain canyon live oak, which is an important constituent of suitable habitat for Tehachapi slender salamander. The scrub, chaparral, and scrub oak communities are included in the model because they may include yucca.

Modeled suitable habitat within Covered Lands for Tehachapi slender salamander is shown in *Figure 5-3, Tehachapi Slender Salamander Modeled Suitable Habitat*. A total of 4,071 acres of suitable habitat for Tehachapi slender salamander was modeled on all Covered Lands. However, because it is unlikely that all modeled suitable habitat would be saturated and because some modeled suitable habitat may not contain the microhabitat features required by this species, not all modeled suitable habitat is expected to be occupied by Tehachapi slender salamander.

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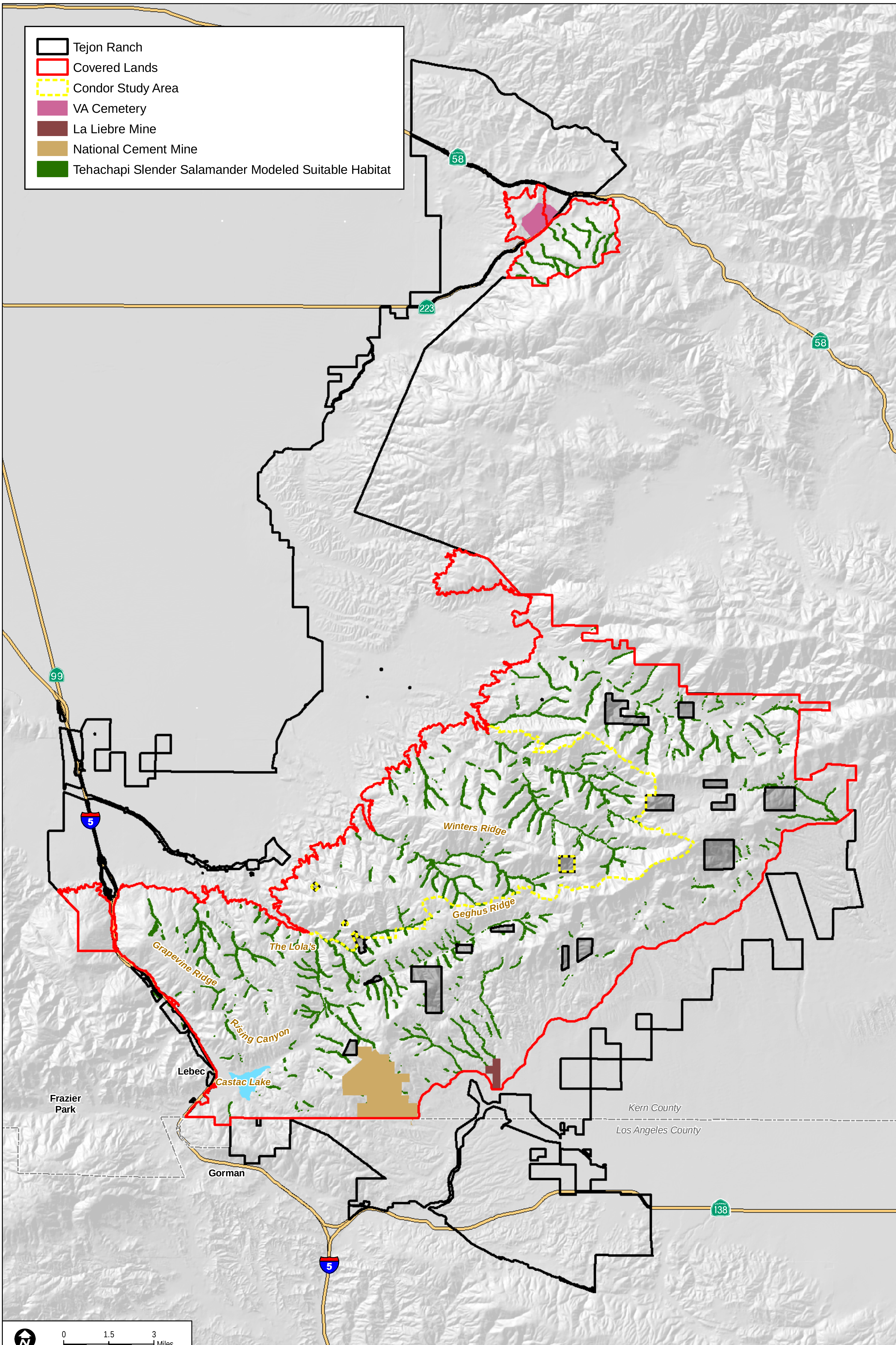

SOURCE: TRC 2007

FIGURE 5-3

Tehachapi Slender Salamander Modeled Suitable Habitat

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5.2.1.2 WESTERN SPADEFOOT

The western spadefoot (*Spea hammondii*) is a member of the *Pelobatidae* or spadefoot toad family. It is a medium-sized species (1.5 to 2.4 inches) and can be green, gray, or brown in color (Jennings and Hayes 1994). It is also randomly marked with dark orange- or reddish-tipped tubercles and has faint hourglass markings on its back that consist of four irregularly light-colored stripes (Jennings and Hayes 1994). The western spadefoot also displays a distinctive black, teardrop-shaped spade on each hind foot. The hind limbs are short, with the ventral side cream in color (Jennings and Hayes 1994). The iris is pale gold and the constricted pupils have a cat-like, vertical, fusiform (i.e., tapering toward each end) shape (Jennings and Hayes 1994).

5.2.1.2.1 STATUS AND DISTRIBUTION

Regulatory History

Western spadefoot has no Federal designation, but is a CDFG Species of Special Concern (CDFG 2011b). The western spadefoot is a Covered Species in the Recovery Plan for vernal pool ecosystems in California and southern Oregon (USFWS 2005).

Natural History

The western spadefoot is almost completely terrestrial, entering water only to breed (Jennings and Hayes 1994). The species aestivates in upland habitats near potential breeding sites in burrows approximately 3 feet in depth (Stebbins 1972) and has been observed using small mammal burrows during periods of aestivation (Jennings and Hayes 1994). The species remains underground 8 to 10 months of the year (Jennings and Hayes 1994; Holland and Goodman 1998; Storey et al. 1999), after which adults emerge from underground burrows to breed during relatively warm (less than or equal to 10.0°C to 12.8°C) rainfall events. While adults typically emerge from burrows from January through March, they may also emerge between October and April if rain thresholds are met (Stebbins 1972; Morey and Guinn 1992; Jennings and Hayes 1994; Holland and Goodman 1998). Though not observed specifically for this species, soil characteristics of burrow refuge sites likely become fairly hard and compact during the period of summer aestivation (Jennings and Hayes 1994; Ruibal et al. 1969).

After periods of warm rains, western spadefoot toads emerge from burrows and form explosive, and sometimes large, aggregations of greater than 1,000 individuals (Jennings and Hayes 1994). Because the critical thermal minimum is 9°C (Brown 1967), western spadefoot toads wait until water temperature is at least 10°C before egg deposition (Jennings and Hayes 1994). Eggs are deposited in irregular small clusters about 9.8 to 11.8 inches in diameter (Holland and Goodman 1998) that are attached to vegetation or debris (Storer 1925) in shallow temporary pools or sometimes ephemeral streamcourses (Stebbins 1985; Jennings and Hayes 1994). The rate of egg hatching is water-temperature-dependent (Brown 1967), but eggs are usually hatched within 6 days. Complete metamorphosis can rapidly occur within 3 weeks (Holland and Goodman 1998) but may last up to 11 weeks (Burgess 1950; Jennings and Hayes 1994). The rate of development is regulated by water temperature, water evaporation, and food resources (Holland and Goodman 1998; Denver et al. 1998; Newman 1998). Denver et al. (1998) found that tadpoles subjected to water volume reduction had a significant acceleration of metamorphosis, but the rate of accelerated development was determined by rate of water reduction and was reversible (decelerated development) by replacement of water. An accelerated metamorphosis appears to be a response to reduce swimming volume and proximity to water surface (Denver et al. 1998).

Western spadefoot toads are almost entirely nocturnal (Holland and Goodman 1998), with most aboveground movement and breeding occurring during rainy nights (Zeiner et al. 1990a). Though little is known of the socio-spatial behavior of western spadefoot toads, they likely do not move far from their breeding pool during the year (Zeiner et al. 1990a), and their entire post-metamorphic home range is likely situated around a few pools. Detailed information on movements of the western spadefoot toad is not available, but opportunistic field observations indicate that they readily move up to at least several hundred meters from breeding sites (NatureServe 2010), while Basey and Sinclear (1980) report that the home range of the western spadefoot is approximately 1 acre. The species may be aggressive at breeding sites (Whitford 1967), likely due to territorial defense of a small breeding zone during the explosive breeding season. Tadpoles may compete for food resources or space with other amphibian larvae, such as western toad (*Bufo boreas*) and Pacific treefrog (*Hyla regilla*) (Zeiner et al. 1990a).

Western spadefoot tadpoles consume planktonic organisms and algae but are also carnivorous and will forage on dead vertebrates and invertebrates (Bragg 1964). Western spadefoot tadpoles are also known to pursue and eat fairy shrimp (order *Anostraca*) (Bragg 1962) and may express carnivorous/cannibalistic behavior when reared with multiple broods that include non-siblings. Farrar and Hey (1997) found that carnivorous western spadefoot toads developed longer snouts, larger beaks with modified cusps, and shorter intestines with fewer loops than omnivores. Adult western spadefoot toads are known to consume butterfly and moth larvae, beetles, termites, and ants (Dimmett and Ruibal 1980a; Whitaker et al. 1977). Additional food items include crickets, flies, earthworms, and other invertebrates (Stebbins 1972; Morey and Guinn 1992).

Distribution and Population Trends

The western spadefoot toad is endemic to California and northern Baja California. The species ranges from the north end of California's great Central Valley near Redding to the south, east of the Sierras and the deserts, into northwest Baja California (Jennings and Hayes 1994; Stebbins 2003). Although the species primarily occurs in lowlands, it also occupies foothill and mountain habitats. Within its range, the western spadefoot toad occurs from sea level to 4,000 feet amsl, but mostly at elevations below 3,000 feet amsl (Stebbins 2003). The western spadefoot has been extirpated throughout most of the lowlands of Southern California and from many locations within the Central Valley (USFWS 2005).

There are no specific data regarding population trends for the western spadefoot toad, although declines are well substantiated based on the loss of formerly occupied habitat (Davidson et al. 2002; Jennings and Hayes 1994). Although the species can be common where it occurs, with breeding populations sometimes numbering in the thousands, by 1994 it was estimated that more than 80% of occupied habitat in Southern California and more than 30% of occupied habitat in northern and central California had been developed or converted to uses that are incompatible with reproduction and recruitment (Jennings and Hayes 1994). As summarized in the Recovery Plan for Vernal Pools (USFWS 2005), as of 1994 spadefoot toads were still extant in 18 counties but extirpated in six others. Fisher and Schafer (1996) documented severe declines in the Sacramento Valley and reduced populations in the eastern San Joaquin Valley. They found spadefoot toads in 13 counties, but not eight in other counties that had historic records. Davidson et al. (2002) found that declines in western spadefoot toad in Southern California were associated most strongly with habitat loss, due primarily to urbanization and, to a lesser extent, agriculture (see “Reasons for Decline,” below).

Reasons for Decline

The main reason for decline of the western spadefoot toad is habitat loss due to urbanization and agricultural conversion (Davidson et al. 2002; Jennings and Hayes 1994), as described above. In addition to the direct loss of aquatic and adjacent upland habitat, other factors appear to have contributed to declining western spadefoot toad populations. Use of mosquito fish for mosquito abatement programs in breeding pools and invasion of breeding pools by bullfrogs threatens some populations because these species are predators of amphibians (Jennings and Hayes 1994; Fisher and Schafer 1996). Successful reproduction and metamorphosis appear to depend on the absence of predators such as bullfrogs, as well as crayfish, fish, and other predatory species from breeding pools (Jennings and Hayes 1994; Fisher and Schafer 1996). Construction activities may cause ground vibration that can mimic rainfall and trigger premature emergence of spadefoot toads from burrows during inappropriate periods (Dimmett and Ruibal 1980b). Over-grazing, off-road vehicles, human trampling, and other activities may degrade western spadefoot toad habitat, as does the spread of exotic plant species (e.g., tamarisk, giant reed, iceplant, and pampas grass), by contributing to altered hydrology, eliminating breeding pools, and restricting access to and quality of upland habitats. However, spadefoot toads have also been documented to breed in altered habitats, including vernal pools that have been altered by earthmoving, disking, intensive livestock use, and off-road vehicles, as well as in artificial ponds, irrigation and roadside ditches, livestock ponds, sedimentation and flood control ponds, irrigation and roadside ditches, roadside puddles, tire ruts, and borrow pits (USFWS 2005). An important element of successful reproduction is a sufficient inundation period in a breeding pool for the spadefoot toad to complete successful metamorphosis, which can be as short as 3 weeks (Holland and Goodman 1998), but may last up to

11 weeks (Burgess 1950; Jennings and Hayes 1994). A study of vernal pools in the Central Valley demonstrated that removal of grazing led to reduced inundation of breeding pools to a duration too short to allow for successful metamorphosis; removal of grazing was associated with a proliferation of non-native vegetation in the breeding pools (Marty 2005). On the other hand, cattle can also deplete water levels and crush and trample spadefoot toad egg masses, metamorphs, sub-adults, and adults, resulting in reduced productivity and individuals that are less than fit (USFWS 2005). Agricultural activities such as disking can cause mortality of spadefoot toads in burrows, and roads can cause mortality through vehicle collisions and be a barrier to dispersal (USFWS 2005). Finally, western spadefoot toads, like other amphibians, may be vulnerable to pesticides, fertilizers, and other chemicals either directly or through contamination of waters in wetlands, but specific effects are unknown (USFWS 2005).

5.2.1.2.2 HABITAT CHARACTERISTICS AND USE

The species prefers open areas with sandy or gravelly soils in a variety of habitats, including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, river floodplains, alluvial fans, playas, and alkali flats (Stebbins 2003; Holland and Goodman 1998), and riparian habitats with suitable water resources (Holland and Goodman 1998). However, the species is most common in grasslands with vernal pools or mixed grassland/coastal sage scrub areas (Holland and Goodman 1998). Within these habitats, the species requires rain pools with water temperatures of between 9°C and 30°C (Brown 1967) in which to reproduce and which persist with more than 3 weeks of standing water (Jennings and Hayes 1994). Jennings and Hayes (1994) report that rain pools must lack fish, bullfrogs, and crayfish in order for successful reproduction and metamorphosis to occur; it is reasonable to assume that this predator-free condition would also apply to waters (e.g., backwater areas) within riparian areas used for breeding.

5.2.1.2.3 OCCURRENCE IN THE COVERED LANDS

Focused surveys were conducted in the TMV Planning Area in 2007 for western spadefoot larvae and/or adults and juveniles in appropriate areas of ponded water, seeps, and springs (Dudek 2009). These surveys occurred on eight occasions in 27 pools in conjunction with fairy shrimp surveys, and the survey areas were reviewed at least one additional time when conducting habitat assessments or focused surveys for California red-legged frog (*Rana draytonii*). Each pool was inspected for the presence of spadefoot toad larvae during the surveys. Surveys occurred monthly during March, April, and May 2007 (Dudek 2009). Approximately 22 of the 27 pools were reviewed for larvae more than once because suitable conditions persisted at those pools and these pools were considered to have the highest likelihood of western spadefoot occurrence. See *Appendix D.1* for more detailed information on survey methods.

The 2007 focused surveys were negative for this species (Dudek 2009). The species also has not been observed in the TMV Planning Area or at Castac Lake during surveys conducted between 1999 and 2005 (Impact Sciences, Inc. 2004; Jones and Stokes 2006a). The species has been documented north and south of the TMV Planning Area (Jennings and Hayes 1994), but not in the immediate vicinity of the TMV Planning Area. Western spadefoot toad may occur in the Covered Lands due to the presence of suitable habitat and the project location at the eastern edge of the species' documented range (CaliforniaHerps 2011; Jennings and Hayes 1994). Due to the negative focused surveys and no past observations of the species, it is considered to have low potential to occur on the Covered Lands below 3,000 feet amsl and very low potential to occur above 3,000 feet amsl, because most occurrences are below 3,000 feet (Stebbins 2003).

Suitable habitat for western spadefoot was modeled for Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitats on Covered Lands are riparian woodland, riparian scrub, riparian/wetland, wetland, wash, seeps, and springs at elevations below 4,500 feet amsl. The vegetation communities and seeps and springs were buffered by 5 feet on each side (10 feet total).

Modeled suitable habitat within Covered Lands for western spadefoot is shown in *Figure 5-4, Western Spadefoot Modeled Suitable Habitat*. A total of 1,175 acres of modeled suitable habitat for western spadefoot was mapped on Covered Lands. However, it is unlikely that all modeled suitable habitat would be saturated, because some modeled suitable habitat may not contain the microhabitat features required by this species, and due to widely fluctuating populations at individual breeding sites (rangewide) as reported in the literature, not all modeled suitable habitat is expected to be occupied by western spadefoot.

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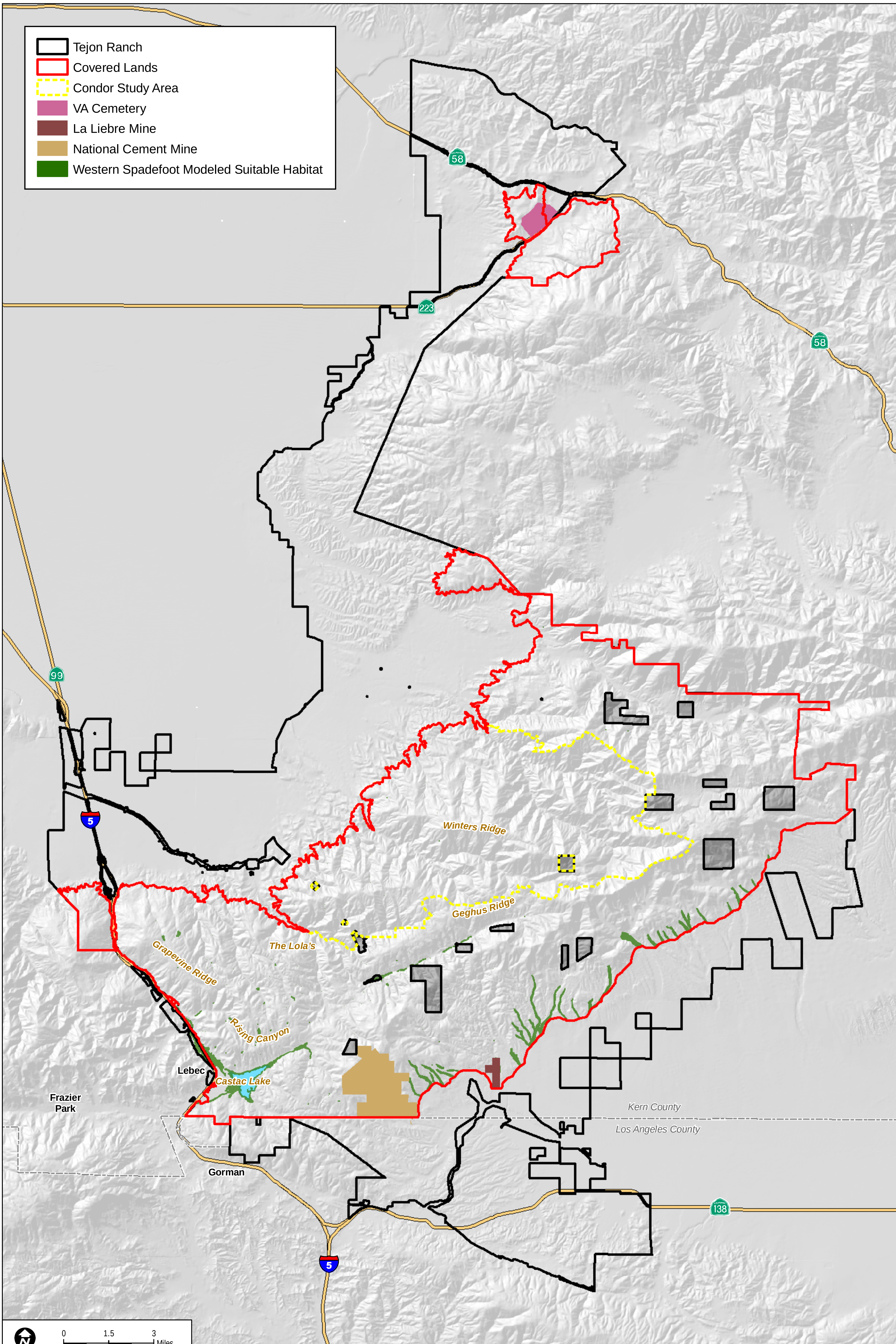

SOURCE: USFWS 2011

FIGURE 5-4

Western Spadefoot Modeled Suitable Habitat

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5.2.1.3 YELLOW-BLOTCHED SALAMANDER

The yellow-blotched salamander (also referred to as yellow-blotched ensatina) is a medium-sized (3 to 6 inches in total length) plethodontid (lungless) salamander. It has a black background color and large yellow or cream blotches. Yellow or orange blotches mark the base of the limbs (CaliforniaHerps 2011). This subspecies has relatively long legs and a short body with 12 to 13 costal (rib) grooves. These salamanders breathe through their smooth, moist, thin skin. This subspecies is sexually dimorphic,[5] illustrated by the fact that males have longer, more slender tails, a shorter snout, and a larger upper lip (CaliforniaHerps 2011).

5.2.1.3.1 STATUS AND DISTRIBUTION

Regulatory History

The yellow-blotched salamander has no Federal or state designation, but is considered a California Species of Concern by CDFG. Species with this designation are vulnerable to extinction by declining population levels, limited ranges, and/or continuing threats (CDFG 2011b).

Natural History

The natural history for yellow-blotched salamander is in large part based on information for the full ensatina species *E. eschscholtzii* where specific information for the subspecies yellow-blotched salamander is lacking. Where specific information for the yellow-blotched salamander is available, it is described as such.

Ensatinas are considered euryphagic predators, meaning they are able to subsist on a wide array of food sources. They feed on a variety of small animals, especially arthropods. Their diet includes, but is not limited to spiders, mites, beetles, sowbugs, crickets, springtails, centipedes, millipedes, termites, earthworms, ants, and snails (Gnaedinger and Reed 1948; Zweifel 1949; Stebbins 1951, 1954; Altig and Brodie 1971; Bury and Martin 1973; Lynch 1985).

Most of the species' feeding occurs at night during wet periods (Stebbins 1954). Prey items are most often located under surface objects. Ensatinas are generally "sit-and-wait" predators, but will also stalk prey items once they are detected. Ensatinas use the hyomandibular apparatus (the portion of anatomy which connects the cranium and jaw) and partially attached tongue to capture prey. Tongue and jaw movements can be adjusted prior to protrusion depending on the distance to and type of prey, among other factors (Deban 1997).

Surface activity of ensatinas is highly correlated with surface moisture (Stebbins 1951, 1954). Yellow-blotched salamanders are most active on rainy or wet nights when temperatures are

[5] "Sexual dimorphism" means differences in the form of a species based on sex.

moderate. During hot and dry periods, they remain inactive underground or in cool, moist areas, such as animal burrows or logs (CaliforniaHerps 2011). Although ensatinas lose body water content rapidly on dry substrates, they can withstand considerable dehydration (Cohen 1952; CaliforniaHerps 2011). Yellow-blotched salamanders are also inactive underground during severe winter weather (CaliforniaHerps 2011).

Yellow-blotched salamanders mainly breed in the fall and spring, although they can breed throughout the winter as well (CaliforniaHerps 2011). Ensatinas reach reproductive maturity at 3 to 4 years. Males are 1.9 to 2.2 inches (48 to 55 millimeters) and females are larger than 2.4 inches (60 millimeters) at sexual maturity (Stebbins 1954). Ensatinas practice an elaborate courtship (Stebbins 1949).

Female ensatinas lay eggs after retreating to aestivation sites (sites where they remain dormant in summer) at the end of the rainy season (Stebbins 1951, 1954; Jones and Aubry 1985). Generally, females lay eggs prior to aestivation at these sites from April to June, although peak activity varies from year to year (USFS 2006b). Female yellow-blotched salamanders lay eggs on land and brood them under bark, in rotting logs, or underground (CaliforniaHerps 2011). Female ensatinas may help keep eggs moist with mucous secretions from the skin. Males are occasionally found near brooding females (Morey and Basey 2005). Ensatina clutch sizes range from three to 25 eggs, but are generally nine to 16 eggs (Petranka and Hayes 1998; Stebbins 1951, 1954).

The longevity of ensatinas is unknown, although estimates range from 8.5 to 15 years (Stebbins 1954; Staub et al. 1995). Adult yellow-blotched salamanders have lived at least 3 years in captivity (Bowler 1977).

The home range of ensatinas has been estimated to be up to 1 acre (USFS 2006b). Stebbins (1954) estimated maximum width of home ranges to be 33 to 135 feet (10 to 41 meters) (mean = 64 feet (19.5 meters)) for males, and 20 to 75 feet (6 to 23 meters) (mean = 33 feet (10 meters)) for females. Males have about twice the home range as females. The movement of juveniles was similar to females (Stebbins 1954).

It is unclear whether yellow-blotched salamanders are territorial. Some evidence for marking, recognizing, and defending home areas has been observed in laboratory settings outside of the breeding season, which may suggest territoriality (Wiltenmuth 1996; Wiltenmuth and Nishikawa 1998). According to Stebbins (1954), males are not known to be territorial, although brooding females act defensively in the immediate vicinity of eggs to protect them against predators.

Ensatinas co-occur with other salamanders, namely those in the genera *Ambystoma*, *Aneides*, *Batrachoseps*, *Dicamptodon*, *Plethodon*, and *Taricha* (Stebbins 1985). Ensatinas, especially juveniles, may compete for food resources with slender salamanders where their ranges overlap (Morey and Basey 2005).

Known predators include Pacific giant salamanders (*Dicamptodon ensatus*), red-legged frogs (*Rana aurora, R. draytonii*), garter snakes (*Thamnophis* spp.), northern rubber boa (*Charina bottae*), common raccoons (*Procyon lotor*), and Steller's jays (*Cyanocitta stelleri*) (Morey and Basey 2005; Wake et al. 1989). Beetle larvae, Jerusalem crickets (*Stenopelmatus* spp.), arboreal salamanders (*Aneides lugubris*), ringneck snakes, sharp-tailed snakes (*Contia tenuis*), white-footed mice (*Peromyscus leucopus*), shrews, and bears are documented as possible predators (Stebbins 1954).

Harassed ensatinas react by standing on their toes, arching their back down, holding their neck erect, and flipping their tails in the direction of the attacker (Stebbins 1951; Brodie 1977). They can secrete a poisonous, sticky, milky substance from glands on their tails when threatened (Hubbard 1903). Ensatina tails can also autotomize (or detach) at the constricted base, although it takes about 2 years for the tails to regenerate and they are only dropped under critical circumstances (Stebbins 1954; Wake and Dresner 1967; Staub et al. 1995). Occasionally, threatened ensatinas will vocalize with a hissing sound, similar to a snake (Stebbins 1951; Brodie 1978).

Distribution and Population Trends

The population trends of the yellow-blotched salamander are unknown, but there are reports of observed occurrences that allow for a characterization of the species' general range and distribution. The yellow-blotched salamander is endemic to California. The known range is restricted to Kern and Ventura Counties in California and extends from the Piute Mountains southwestward to the vicinity of Alamo Mountain along the Tehachapi Mountains (CDFG 2008b). Yellow-blotched salamanders are found at elevations ranging from 1,400 to 7,496 feet amsl (427 to 2,285 meters) at Piute Peak in Kern County (Jennings and Hayes 1994). Major populations of this subspecies are known from the Tehachapi Mountains and Mount Pinos, near Fort Tejon, and near Frazier-Alamo Mountain (CaliforniaHerps 2011).

Reasons for Decline

Although ensatinas are usually common where present (AmphibiaWeb 2007), the very narrow distributional range of the yellow-blotched salamander makes it susceptible to any changes in habitat. At the same time, the yellow-blotched salamander is much more widespread and abundant than Stebbins (1949) originally thought, largely because until recently most of its range had been poorly examined (Jennings and Hayes 1994). In addition, concerns regarding the yellow-blotched salamander's susceptibility to decline by the pet trade are now less significant since selling California amphibians and reptiles has become illegal (Nicola 1981), but poaching is still a concern.

This taxon is especially threatened by development and the cutting of oak woodland in the Tehachapi Mountains (Jennings and Hayes 1994). Logging operations on Alamo Mountain may also threaten this species (LPFW 2007). The Tehachapi Mountains, Cummings Valley, and Bear

Valley areas south of California Highway 58 have undergone significant development, which threatens a significant portion of the range of the yellow-blotched salamander (Jennings and Hayes 1994). Existing and planned development has largely focused on oak woodlands, which is likely the most important habitat used by yellow-blotched salamanders (Jennings and Hayes 1994). In addition, other land uses, such as cattle grazing, hunting, camping, agriculture, and mining, may directly or indirectly impact yellow-blotched salamanders by altering habitat or creating soil disturbance (Jennings and Hayes 1994; Germano 2006). Additionally, feral pigs cause damage to animals and habitat (Hansen and Wake, pers. comm. 2008).

5.2.1.3.2 HABITAT CHARACTERISTICS AND USE

Generally the yellow-blotched salamander subspecies has more specific habitat requirements than typically described for the full ensatina species. Ensatinas broadly occur in coniferous forest, deciduous forest, oak woodland, coastal sage scrub, and chaparral (Stebbins 1951). The yellow-blotched salamander subspecies, however, occurs most often in mountain meadow and mixed-conifer type habitats, according to USFWS (USFS 2006b). CaliforniaHerps (2011) similarly describes this subspecies as occurring in evergreen and deciduous forests. Occurrence of the yellow-blotched salamander is positively correlated with canyon live oak, but is negatively correlated with blue oak (Block and Morrison 1998). In general, mean canopy cover exceeds 55% (Germano 2006); however, Hansen and Wake (pers. comm. 2008) indicate that this subspecies might occur under any canopied area on north-facing (0 to 90 degrees and 0 to 270 degrees) slopes.

As a species, ensatinas are generally abundant at edge habitats and seem to prefer flat or gently sloping shelves above flood level to steep terrain. According to Stebbins (1951), however, the yellow-blotched salamander subspecies is more prevalent in north-facing areas that are shaded, especially near creeks and streams.

Yellow-blotched salamanders are found under rocks, logs, and other surface debris, especially under fallen bark near decaying logs (CaliforniaHerps 2011). Soils are generally loamy and relatively warmer and moister than the ambient temperature and humidity (Germano 2006). This subspecies stays inside moist logs, animal burrows, and woodrat nests, and under roots or rocks during dry or very cold weather (CaliforniaHerps 2011).

A study of the habitat characteristics of sites with yellow-blotched salamanders found differences between sites in which adults and juveniles are present (Germano 2006). Adults were found more often in drier soil, farther from streams, and on slopes with a northwestern aspect as compared to juveniles (Germano 2006).

5.2.1.3.3 OCCURRENCE IN THE COVERED LANDS

Surveys for yellow-blotched salamander were conducted concurrently with surveys for Tehachapi slender salamander because both species occupy similar habitats. As described in

Section 5.2.1.1.3 for Tehachapi slender salamander, surveys for salamanders were conducted in the TMV Planning Area in four phases by Jones and Stokes biologists. The first phase occurred in April and June 2005 and consisted of initial reconnaissance-level surveys. The second phase occurred in March 2007; these surveys assessed the suitability of habitat in additional drainages that were not previously surveyed. The third phase consisted of focused surveys for yellow-blotched salamander conducted in May 2007 within approximately 77 drainages identified in earlier reconnaissance surveys to determine if these locations were occupied by the species. These focused surveys concentrated on areas located 20 feet on either side of the streambed, where soils generally remain moist for the longest period during the summer. The fourth phase was conducted in July, August, and September 2007, and consisted of supplementary field habitat assessments in several additional drainages (Dudek 2009). An additional habitat assessment and focused survey for yellow-blotched salamander was conducted by ICF in the Beartrap Turnout Improvement Project study area in May 2008, but no individuals were observed (Kohn, pers. comm. 2008a, 2008b). However, the site supports approximately 0.2 acre of suitable habitat. See *Appendix D.1* for more detailed information on survey methods.

Approximately 17 yellow-blotched salamanders were observed on site during surveys in drainages along or near Middle and Salcito ridges; in the vicinity of Monroe, Silver, Squirrel, and Palos Altos Canyons; and along Beartrap Canyon and its tributaries (Dudek 2009). There is one CNDDB occurrence of yellow-blotched salamander in the TMV Planning Area, in a drainage adjacent to and north of Rising Canyon (CDFG 2011a). In 2005, two yellow-blotched salamanders were observed in a drainage located in the eastern/central portion of the Covered Lands (Jones and Stokes 2006a).

Suitable habitat for yellow-blotched salamander was modeled on all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitat includes all canopy with greater than 40% coverage on north-facing slopes at all elevations.

Modeled suitable habitat within Covered Lands for yellow-blotched salamander is shown in *Figure 5-5, Yellow-Blotched Salamander Modeled Suitable Habitat.* A total of 35,213 acres of suitable habitat for yellow-blotched salamander was modeled on all Covered Lands. Because presence/absence survey results in the TMV Planning Area were positive and because Covered Lands are within the range of this species, yellow-blotched salamander is expected to occur in modeled suitable habitat within Covered Lands with distributions similar to those found within the TMV Planning Area. It is unlikely, however, that all modeled suitable habitat would be saturated, and because some modeled suitable habitat may not contain the microhabitat features required by this species, not all modeled suitable habitat is expected to be occupied by yellow-blotched salamander.

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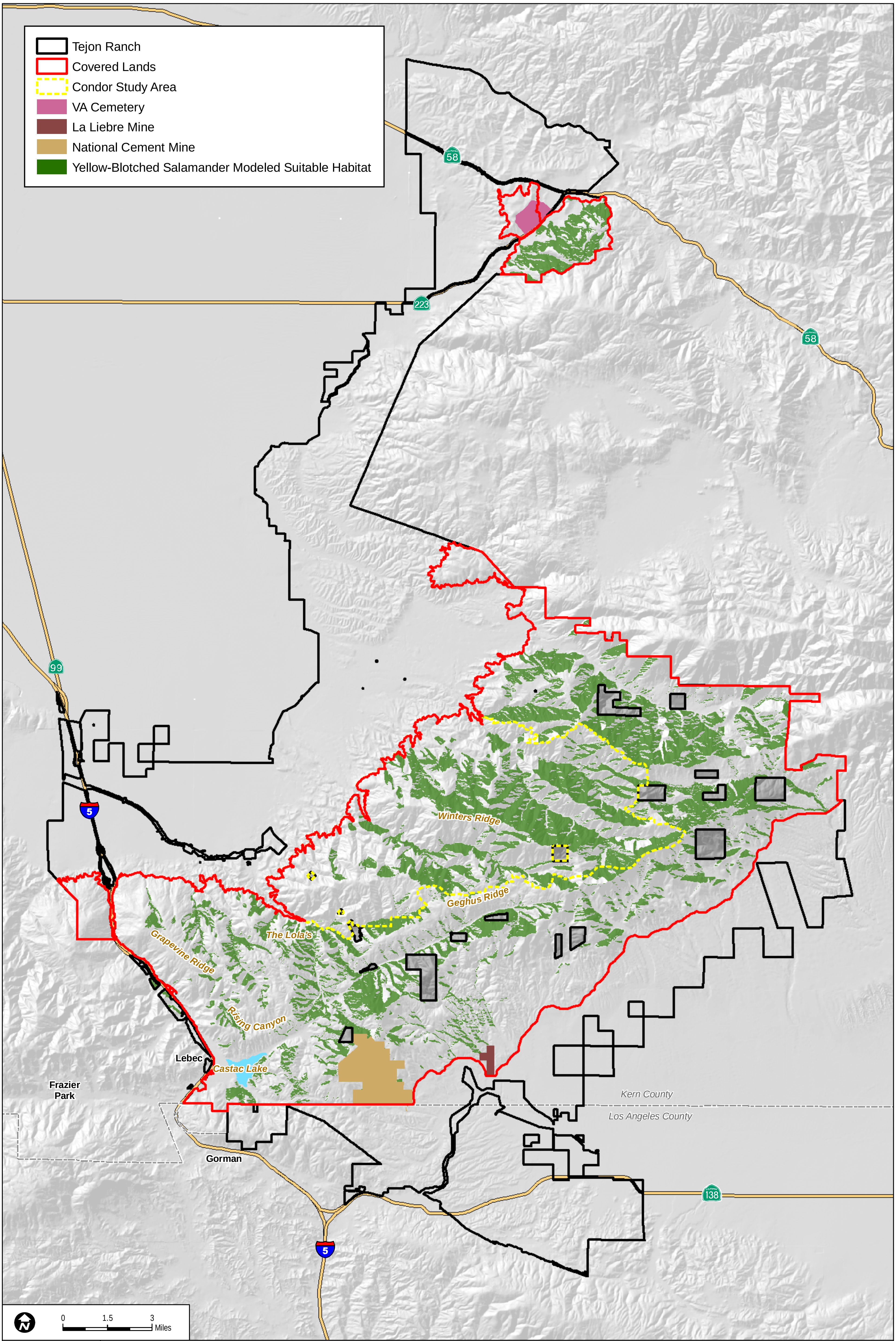

SOURCE: TRC 2007

FIGURE 5-5

Yellow-Blotched Salamander Modeled Suitable Habitat

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5.2.2 BIRDS

5.2.2.1 AMERICAN PEREGRINE FALCON

The American peregrine falcon (*Falco peregrinus anatum*) is a member of the falcon family (*Falconidae*), one of two families usually placed in the order *Falconiformes*. There are 19 subspecies of peregrine falcons, three of which occur in North America, including the American peregrine falcon (*F. p. anatum)* (White et al. 2002). The American peregrine falcon[6] is a medium- to large-sized falcon with a dark malar stripe or "mustache" that extends down from its eye to the top of its breast. Adults have slate-gray backs and whitish, grayish, or buff-colored underparts with a variable amount of barring and spotting. Juveniles may have pale to gray or brown backs and have streaked rather than barred undersides. Females are 18 to 23 inches (45 to 58 centimeters) long and weigh approximately 32 ounces (900 grams), making them 15% to 20% larger than males and 40% to 50% heavier. Eastern American peregrine falcons are larger and darker than their western counterparts (White et al. 2002; Michigan Department of Natural Resources 2008).

5.2.2.1.1 STATUS AND DISTRIBUTION

Regulatory History

The American peregrine falcon was Federally delisted on August 25, 1999, due to recovery (64 FR 46542–46558) and state delisted on August 6, 2009 (California Fish and Game Commission 2009). However, the species remains a California Fully Protected species (CDFG 2011b), and is also protected under the Federal Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703–712).

A comprehensive Recovery Plan for the species in the eastern part of the country was completed in 1979 and revised in 1987. The primary objective of the plan was to restore a self-sustaining population of the peregrine falcon in the eastern United States (USFWS 1991). Recovery of this species was largely due to the success of captive breeding and release programs. Currently, the Federal *Monitoring Plan for the American Peregrine Falcon* is in effect, requiring populations in six regions in the country to be monitored until 2015 (USFWS 2003). This is the first nationwide monitoring plan for a recovered, delisted species.

Natural History

Pairs of peregrine falcons occupy territories around their nests that they defend with vocalizations and attacks (White et al. 2002; Cade 1960). Minimally, this territory includes a 300-foot (96-meter) radius around the nest, and is usually larger (Cade 1960). Size of territory

[6] Peregrine falcon (Falco peregrinus), which includes the subspecies American peregrine falcon, is referred to in this species account when documents cited included information on the species, peregrine falcon, but did not provide specific information on the subspecies, American peregrine falcon.

and level of boundary defense are probably affected by prey abundance (White et al. 2002). Home range of individual pairs also fluctuates with prey abundance, and varies from approximately 123.5 square miles (320 square kilometers) in Sonoma County to 642 square miles (1,662 square kilometers) in the Rocky Mountains. Inland nest sites in California are 3 to 7 miles (5 to 12 kilometers) apart (Zeiner et al. 1990b). Pair members often perch side by side, and pair bonds remain established year-round in resident birds (White et al. 2002).

Breeding occurs from early March to late August. The clutch size varies from three to seven eggs. Incubation lasts 33 to 35 days and is performed by both parents (White et al. 2002; Brown 2006a). The young typically fledge between 35 and 42 days (Brown 2006a). They are not independent of the parents for several months and often pursue adults to solicit food (White et al. 2002). First-year young remain in social groups several months after nest departure and may start migration together (Cade 1960).

The hatching success of the peregrine falcon in the wild is about 75%. An average of one young reaches fledging per laying pair. The juvenile birds continue to be particularly vulnerable during their first year of life as they learn to hunt and develop flying skills (USFWS 1991). Enderson (1969) estimated annual juvenile mortality at approximately 70% and adult mortality at approximately 25%. The mean life expectancy for the young that fledge is approximately 4 years. The maximum lifespan of the peregrine falcon is in excess of 13 years, and it is possible that a few individuals may reach 20 years of age.

The diet of the peregrine falcon primarily consists of birds that, while most are pigeon-sized, can be as small as hummingbirds or as large as small geese (White et al. 2002). Where they are available, pigeons and doves comprise a large portion of this species' diet. Other prey species include jays, flickers, meadowlarks, starlings, woodpeckers, shorebirds, and other readily available birds. The peregrine falcon may feed on large numbers of lemmings and voles when these rodents are present in abundance (Brown 2006a). Bats and squirrels may also be occasionally eaten (White et al. 2002). The peregrine falcon typically hunts its prey in the air or from a perch. Some pairs hunt cooperatively, with the larger female diving for the prey first and then, if successful, eating first from the prey item (Brown 2006a). Surplus prey may be cached and eaten later, or used in courtship feeding (White et al. 2002).

Distribution and Population Trends

The peregrine falcon has a worldwide distribution that is more extensive than that of any other bird. The only regions this species does not occupy as a breeder are the Amazon Basin, the Sahara Desert, Antarctica, and most of the steppes of central and eastern Asia. In North America, the three subspecies of peregrine falcon breed from Alaska to Labrador, southward to Baja California and other parts of northern Mexico, and east across central Arizona through Alabama. Its distribution is patchy in North America, and populations in the eastern United States are still chiefly in urban areas (AOU 1998; White et al. 2002). The distribution is likely to change as the species reoccupies areas from which it was formerly extirpated (White et al. 2002). The former breeding range also included Ontario, southern Quebec, the Canadian Maritime Provinces, and all of the eastern United States south to northern Georgia. In the Americas, the species winters from southern Alaska to Tierra del Fuego in southernmost South America (AOU 1998). The American peregrine falcon occurs from Alaska and western Canada (south of the tundra) through the Great Plains and the western United States to northern Mexico, except for the Pacific Northwest and various island chains west of Canada and south of Alaska (White et al. 2002). Although the American peregrine falcon is widespread in North America, little was known of its population status prior to the 1940s. The population was stable from the 1940s until the 1950s to the mid-1970s, when the population crashed, primarily due to dichlorodiphenyltrichloroethane (DDT) (White et al. 2002).

In California, the American peregrine falcon is an uncommon breeder or winter migrant throughout much of the state. It is absent from desert areas (Zeiner et al. 1990b). It was estimated that the breeding population had declined across the state by about 90% by the 1970s, with an estimated population of 22 to 40 active pairs (Comrack and Logsdon 2007). After restrictions on DDT took effect in 1970 in Canada and 1972 in the United States, the population stabilized in the late 1970s and rapidly increased in the 1980s, and it was still increasing as of 2001 (White et al 2002). The population was estimated at 2,500 to 3,000 pairs, with 329 eyries in California, Oregon, and Washington as of 1999 (White et al. 2002). Through 2007 in California, approximately 274 nesting sites were documented as “active” (i.e., used at least once since 1975) in 40 counties spanning the length of the state (Comrack and Logsdon 2007, Table 1). About 57% of the active nesting sites are in eight counties: Santa Barbara (32 sites), Mendocino (29 sites), Humboldt (22 sites), Los Angeles (19 sites), Siskiyou (17 sites), Trinity (15 sites), San Luis Obispo (13 sites), and Sonoma (10 sites). Reproductive productivity in California also increased dramatically from 1975 to 1989, from 12 young wild-fledged (i.e., fledged from unmanipulated sites) in 1975 to 99 young wild-fledged in 1989 (Comrack and Logsdon 2007, Table 2).

Despite an increasing population in California, the species is still designated as imperiled (NatureServe 2010). Nonetheless, based on an evaluation of a petition to delist the species by CDFG staff in 2007 (Comrack and Logsdon 2007), CDFG delisted the American peregrine falcon in 2009 for several stated reasons, including the following:

- The breeding population had increased dramatically and may have reached or exceeded historic levels in California.
- The threat posed by organochlorine pesticide contamination had diminished, although some “hotspots” remain.
- The Federal recovery goals for the California population had been achieved (resulting in the Federal delisting in 1999), and productivity goals had been met at most sites, but not all, in California.

- The captive breeding and reintroduction program established in the 1970s and conducted through 1992 was very successful.
- Even with delisting, the species would remain Fully Protected in California Fish and Game Code, Section 3511(b)(1).

Reasons for Decline

Prior to Federal protection, the main cause of the American peregrine falcon decline was the use of pesticides, such as DDT and its metabolite, dichlorodiphenyldichloroethylene (DDE), which interfered with its calcium metabolism and resulted in eggs with thin shells that were easily broken (White et al. 2002; USFWS 2003). Restrictions on DDT in 1970 in Canada and 1972 in the United States resulted in a rebound of the peregrine falcon population in North America. However, loss of suitable nesting places and wetland habitat supporting large avian populations also likely harmed the species (White et al. 2002). In addition, nesting sites have been abandoned due to human encroachment or increased levels of nearby activity (Bond 1946; Hickey 1969), although these impacts did not contribute significantly to historical population declines.

Comrack and Logsdon (2007) list other factors that could result in mortality or injury of peregrine falcons, including native predators; predation on young falcons by cats and dogs; disturbance of nest sites due to recreational rock climbing (Brambilla et al. 2004); activities of researchers, falconers, and egg collectors; occasional shootings; collisions with structures or objects, especially by fledglings practicing their flight; and, in urban areas, electrocutions from collisions with electrical wires or towers.

5.2.2.1.2 HABITAT CHARACTERISTICS AND USE

The American peregrine falcon occurs near wetlands, lakes, rivers, or other waters, as well as on cliffs, banks, dunes, mounds, and human-made structures (CDFG 2011a). Peregrine falcons use a large variety of open habitats for foraging, including tundra, marshes, seacoasts, savannahs, grasslands, meadows, open woodlands, and agricultural areas. The high mobility, extensive hunting area, remote nest sites, and preferences of the individual pairs make it difficult to identify what might be typical peregrine falcon habitat (USFWS 1984b); and no particular terrestrial biome appears to be preferred over others (White et al. 2002). However, the species is often observed near tall cliffs and near water sources (AOU 1998; Brown 2006a). Riparian areas, as well as coastal and inland wetlands, are important habitats year-round for this species. Protected cliffs and ledges are often used for cover (Brown 2006a; Zeiner et al. 1990b). Like many other migratory birds of prey, peregrine falcons often travel along mountain ridges on both eastern and western coastlines during migration. During migration, the peregrine falcon may be found near marshes, lakes, and ponds with high concentrations of water fowl, shorebirds, and other birds. Within Southern California, peregrine falcons are primarily found at coastal estuaries and inland oases (Garrett and Dunn 1981; Brown 2006a).

Breeding requires cliffs or suitable surrogates that are close to preferred foraging areas. Nests are typically located on cliffs between 164 to 656 feet (50 to 200 meters) tall that are prominent in the landscape (White et. al 2002). Peregrine falcons have also been known to nest in trees and on small outcrops. Tall buildings, bridges, or other tall man-made structures are also suitable for nesting (White et al. 2002). The nest site usually provides a panoramic view of open country and often overlooks water. It is always associated with an abundance of avian prey, even in an urban setting. A cliff nest site may be used for many years (Brown 2006a). The nest site itself, often referred to as an eyrie, usually consists of a rounded depression or scrape with accumulated debris that is occasionally lined with grass (Call 1978). Higher-quality nest sites confer greater protection from the elements and have greater breeding success (Olsen and Olsen 1989). On sandy coastal bluffs without cliffs in California, peregrine falcons use deserted raven, cormorant, and red-tailed hawk nests (White et al. 2002).

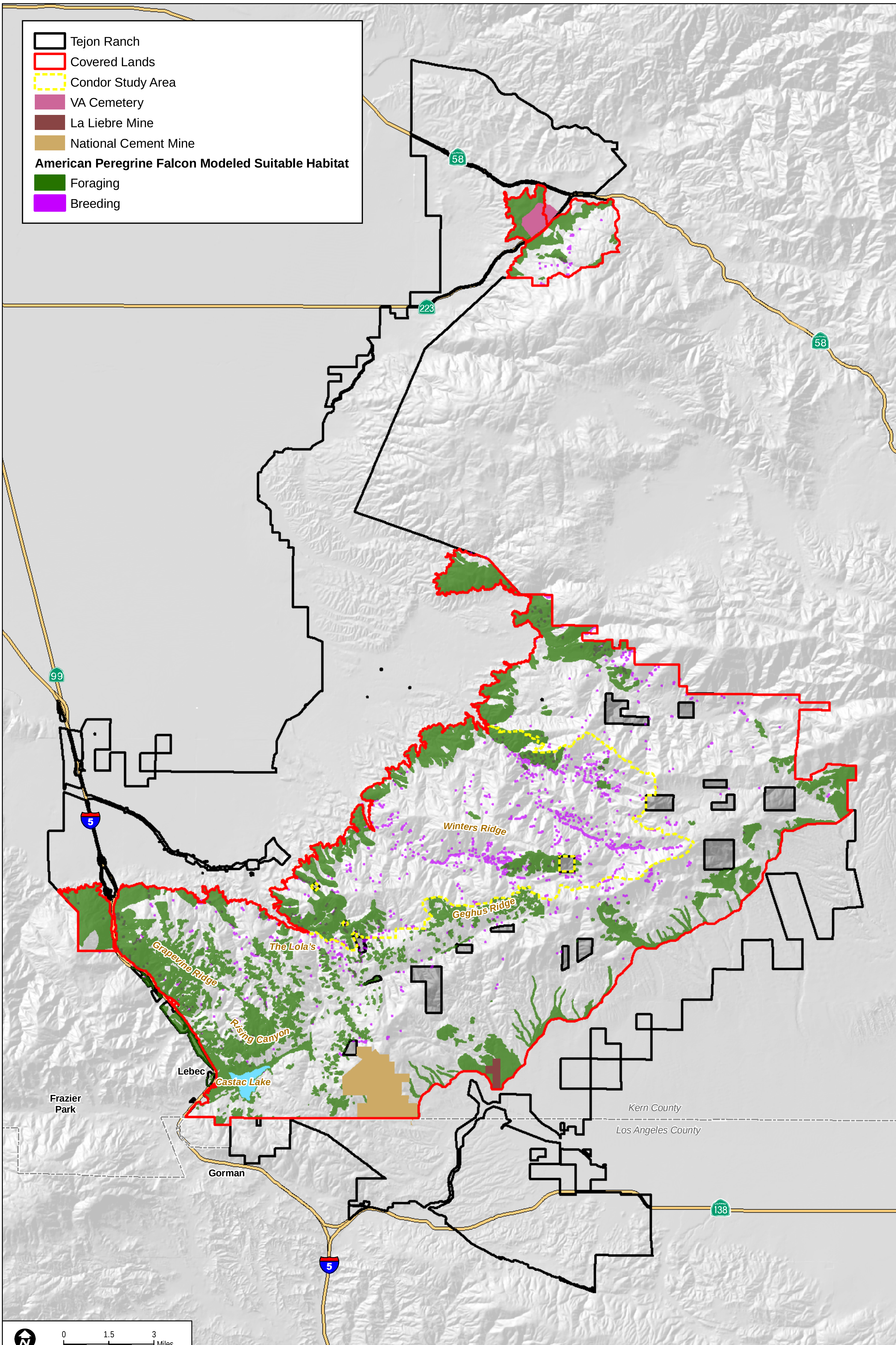
5.2.2.1.3 OCCURRENCE IN THE COVERED LANDS

A focused survey for American peregrine falcon was conducted by Dudek in 2007 in the TMV Planning Area (Dudek 2009). All large rock outcrops and cliffs located in the TMV Planning Area were surveyed for peregrine falcon activity (whitewash, nests, and other raptor activity), including in the prominent rocky cliff in Rising Canyon, and other less prominent rocky outcrops associated with Skinner Canyon, Grapevine Peak, Pastoria Canyon, and Salcito Ridge. Two focused surveys were conducted—on May 1 and July 7, 2007—during the time period when peregrine falcons could be present and breeding in the TMV Planning Area. When a sign of raptor activity was detected, these areas were observed for a long enough period of time to identify the raptor species using the area. Rock outcrops adjacent to known raptor nests were also observed to determine if use of the nest site was by peregrine falcon. General surveys for other nesting special-status raptors were also conducted by Dudek in the TMV Planning Area in spring and summer 2007, and winter use surveys were conducted in November of 2006 for special-status birds, including raptors. The spring and summer surveys used the methods described by Fuller and Mosher (1987), including: (1) early season driving and road surveys to identify potential nest locations, and (2) follow-up driving, road, or pedestrian surveys to identify additional locations and provide nesting success information (Dudek 2009). These raptor nesting surveys focused on oak woodlands, but raptor observations were also recorded during other wildlife surveys (i.e., riparian bird, aquatic and marsh bird, and burrowing owl surveys). Chaparral was also surveyed by road to supplement the oak woodland surveys. The first set of nesting surveys was conducted early in the nesting period, between March 6 and March 30, 2007. A second set of nesting surveys, including approximately 18 road and walking surveys, was conducted between June 4 and July 6, 2007. A winter special-status bird survey was conducted between November 14 and November 16, 2006 (Dudek 2009). Other surveys conducted on site that would have incidentally detected American peregrine falcons included general raptor surveys, aquatic and marsh bird surveys, and bald eagle surveys. Raptor surveys focused on searching trees, fence lines, rock outcrops, and the ground for direct observation or evidence of raptor nesting. The aquatic and marsh bird surveys and bald eagle surveys included an inventory of all wildlife using aquatic resources in and around the adjacent Castac Lake (Dudek 2009). See *Appendix D.1* for more detailed information on survey methods.

Three American peregrine falcons were documented during the wintering bird survey at Castac Lake in mid-November 2006 (Dudek 2009). One adult peregrine falcon was observed on site chasing a heron into Castac Lake. Two other individuals were observed foraging over the lake and also were observed immediately adjacent to the lake. These observations occurred during the non-breeding season, and the three individuals were not observed displaying any nesting or courtship behavior. No other peregrine falcons were documented during the 2007 focused peregrine falcon survey or during the other spring bird surveys in 2007. These surveys would have detected breeding activity by peregrine falcons in the TMV Planning Area if it occurred. Previous surveys conducted between 1999 and 2004 (Impact Sciences, Inc. 2004) and 2005 (Jones and Stokes 2006a) did not observe peregrine falcons, but both studies concluded that the species has potential to forage on site but low potential to nest on site. Because the American peregrine falcon is known to migrate through the region, it was concluded that this species uses the TMV Planning Area during migration and for winter foraging, but is unlikely to nest on site (Dudek 2009). This species also has low potential to breed in the TMV Planning Area and the remainder of Covered Lands due to a limited amount of suitable nesting habitat.

Suitable habitat for American peregrine falcon was modeled on Covered Lands (see *Appendix D* for habitat modeling methods). Modeled nesting habitat includes cliffs and bluffs. Modeled foraging habitat includes areas of agriculture, grassland, riparian scrub, riparian/wetlands, wetlands, lake, and wash.

Modeled suitable habitat within Covered Lands for American peregrine falcon is shown in *Figure 5-6, American Peregrine Falcon Modeled Suitable Habitat*. A total of 26,742 acres of foraging habitat and 80 acres of nesting habitat for American peregrine falcon was modeled on Covered Lands.



SOURCE: TRC 2007

FIGURE 5-6

American Peregrine Falcon Modeled Suitable Habitat

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5.2.2.2 BALD EAGLE

There are eight species in the genus *Haliaeetus*, which are distributed worldwide except in South America. The genus is most closely related to the other fish eagles and is perhaps also related to the scavenging kites and to the Old World vultures. The bald eagle (*Haliaeetus leucocephalus*) is likely most closely related to, and may constitute a superspecies with, the white-tailed eagle (*H. albicilla*) (Buehler 2000).

The bald eagle is a large raptor with a distinctive white head and tail and dark brown body and wings at maturity. Although the sexes are similar in appearance, females are slightly larger than males on average. Juveniles are distinguished from adults by their dark brown head, body, wings, and tail. Plumage also varies with timing and sequence of molt (McCollough 1989).

5.2.2.2.1 STATUS AND DISTRIBUTION

Regulatory History

The bald eagle was initially listed on February 14, 1978, as an endangered species throughout the lower 48 states, except in Minnesota, Michigan, Wisconsin, Washington, and Oregon, where it was listed as a threatened species. On July 12, 1995, USFWS announced that the bald eagle would be reclassified from endangered to threatened in the lower 48 states, effective August 11, 1995 (60 FR 35999–36010). This species was delisted from the list of Federally threatened and endangered species on July 9, 2007 (USFWS 2007a). The banning of the pesticide DDT and the habitat protection afforded by the Federal Endangered Species Act for nesting sites and important feeding and roost sites precipitated the delisting (USFWS 2007a). The bald eagle is still protected under the Bald and Golden Eagle Protection Act and the MBTA (USFWS 2007a; 16 U.S.C. 703–712). Despite Federal delisting, the bald eagle is still designated as an endangered species in California and is Fully Protected in the state.

Natural History

Fish dominate the typical diet of bald eagles; however, many other types of prey are also taken, including waterfowl, small mammals, and carrion, especially in the wintering areas (60 FR 35999–36010). The bald eagle swoops from hunting perches or soaring flight to pluck fish from water. It is also known to wade into shallow water to pursue fish. It may pounce on, or chase, injured or ice-bound water birds. In flooded fields, the species occasionally pounces on displaced voles, or other small mammals. Open, easily approached hunting perches and feeding areas are used most frequently (Zeiner et al. 1990b). Bald eagles may hunt cooperatively (Brown 2006b). Studies of prey items in Northern California showed bald eagles do not differentiate between native and non-native freshwater fish species (Jackman et al. 1999). One study of bald eagles in Texas found them to eat a relatively equal proportion of birds, reptiles, and fish (Mabie et al. 1995). One wintering population in the lower Great Lakes basin fed on carcasses of white-tailed deer during 47% of observed feedings (Ewins and Andress 1995). The same group observed immature individuals feeding on garbage and offal during 39% of observed feedings. The bald eagle competes with, and steals prey from, osprey (Zeiner et al. 1990b). It has also been observed causing a turkey vulture to disgorge its food (Brown and Amadon 1968).

Wintering bald eagles in New Mexico spent 95.3% of their time perched and 4.7% in flight (Zwank et al. 1996). Of the time spent in flight, 13.0% was spent foraging (Zwank et al. 1996). Winter feeding usually occurs immediately after dawn and in late afternoon (Zeiner et al. 1990b).

Bald eagle nesting occurs in open areas near water. These nests are often in large snags or old-growth trees (Brown 2006b). The bald eagle will also nest in a dominant live tree with open branches, especially ponderosa pine (*Pinus ponderosa*). It nests most frequently in stands with less than 40% canopy cover, but usually with some foliage shading the nest (Call 1978). It often chooses the largest tree in a stand on which to build its stick platform nest. The nest may be a massive structure, 12 feet high and 8.5 feet across, with a wet mass of decaying vegetation in the center (Brown and Amadon 1968). The nest is usually located near a permanent water source. In California, 87% of the nest sites of the bald eagle were within 1 mile of water. Individuals have been known to use the same nest for up to 35 years (Brown 2006b).

The clutch size of the typically monogamous (Zeiner et al. 1990b) bald eagle is usually two, but can vary from one to three, and eggs are laid once annually (Brown 2006b). The bald eagle breeds from February through July, with peak activity from March to June. Incubation of the eggs usually lasts 34 to 36 days (Ehrlich et al. 1988). The young of the bald eagle leave the nest 70 to 98 days after hatching but do not reach breeding age until 4 or 5 (Brown 2006b). A mark-recapture study of a breeding population in Texas concluded that birds fledged there may disperse to breeding communities throughout the southern United States (Mabie et al. 1994).

In one study of bald eagle nests in British Colombia, Canada, food supply was identified as the "key factor" in limiting breeding success (Elliot et al. 1998). Because of the asynchronous hatching, the older nestling may kill the younger, smaller sibling if the food supply is inadequate (Brown and Amadon 1968). The recorded longevity is 28 years in the wild and 36 years in captivity. Bald eagles may follow a survival pattern similar to other raptors with lower first-year survival, followed by increasing survival to adulthood. Adult survival is high in most studies conducted on survivorship (Buehler 2000).

The bald eagle home range of resident pairs on the Columbia River averaged 13.67 square miles for both breeding and non-breeding periods (Garrett et al. 1993). The breeding territory in Alaska (n=14), varied from 11 to 45 hectares (28 to 112 acres), and averaged 23 hectares (57 acres) (Hensel and Troyer 1964). Non-breeding bald eagles, however, are known to use much larger areas. These non-breeding areas are not used with the same consistency as breeding territories; rather they travel widely in search of food resources (Buehler 2000). Home range has been estimated at 2.6 square miles (6.6 square kilometers) at Klamath Lake, Oregon (Frenzel 1984), to approximately 250 square miles (648 square kilometers) in Arizona (Grubb et al. 1989). Breeding territory size generally ranges from 0.5 to 2 square miles (1.3 to 5.23 square kilometers) (Buehler 2000). Non-breeding eagles, including wintering individuals, are not very aggressive and associate freely (Buehler 2000); however, this is anticipated to change based on food availability (Hansen 1986).

Distribution and Population Trends

The bald eagle is the only sea eagle regularly occurring on the North American continent. Bald eagles breed locally from Alaska eastward to Newfoundland and southward locally to Baja California, Sonora, Texas, and Florida. The species winters in the large majority of the breeding range but generally withdraws from central Alaska and the central and the northern portions of Canada (AOU 1998). Despite its widespread distribution in North America, the bald eagle has significantly declined in the southern and eastern part of its range (NatureServe 2010). This species remains susceptible to a number of threats, particularly environmental contaminants and excessive disturbance by humans (see “Reasons for Decline,” below). At the same time, recent rangewide growth in numbers and the protection offered by governments have buffered this decline (NatureServe 2010). According to the National Audubon Society, public and private protection of the bald eagle has increased populations from 417 active nests in the lower 48 states in 1963 to 4,450 in 1994 (60 FR 35999–36010). The winter population is estimated to exceed 20,000 individuals within the continental United States (Beuhler 2000).

In California, breeding populations of bald eagles are now restricted mostly to Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties (Polite and Pratt 2005). Recent breeding attempts on the mainland south of Santa Barbara County (e.g., Silverwood Lake, Lake Skinner, and Lake Perris) have been unsuccessful (Cleary-Rose, pers. comm. 2002). Individuals that breed in California may make only local winter movements in search of food.

Within mainland Southern California, the species primarily winters at larger bodies of water in the lowlands and mountains (Garrett and Dunn 1981). It is fairly common as a local winter migrant at a few favored inland waters in Southern California, with the largest numbers occurring at Big Bear Lake, Cachuma Lake, Lake Mathews, Nacimiento Reservoir, San Antonio Reservoir, and along the Colorado River (Zeiner et al. 1990b).

The annual Midwinter Bald Eagle Survey indicates that California’s winter population of bald eagle appears to be at least stable, although varying from year to year and exceeding 1,000 birds some winters. The number of occupied territories in California has grown from 107 in 1990 to 323 in 2010 (CDFG 2011c). Typically, about half of California’s wintering bald eagles are found in the Klamath Basin along the California–Oregon border, the location of the largest winter concentration of bald eagles in the contiguous United States (CDFG 2011c).

Based on CDFG-coordinated breeding surveys begun in 1973, the bald eagle is also experiencing an increase in the number of breeding territories and an expansion in its range throughout the state. The number of occupied breeding territories increased from 32 in 1977 to 94 in 1990, 105 in 1995, 151 in 1999, and peaked at 175 in 2003 (CDFG 2011c). Between 2001 and 2003, 14 new territories were discovered, extending the southern range to Lake Hemet in Riverside County. The breeding range of the bald eagle expanded from eight counties in 1981 to 32 counties in 2003, when the number of occupied breeding territories peaked. By 2009 and 2010, however, the number of occupied breeding territories declined to 105, and the number of young produced, which peaked in 2003 at 150, declined to 58 in 2010 (CDFG 2011c). The bald eagle's main breeding population in California is still largely restricted to the northern part of the state in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties (Polite and Pratt 1999). Populations in Southern California remain low with only two successful nests documented since the year 2000 on Santa Catalina Island (CDFG 2011c).

Reasons for Decline

Habitat loss, the expressed effects of select pesticides on reproductive success, and persecution of the species necessitated the listing of the bald eagle. The use of DDT after World War II led to eggshell thinning, which drastically reduced reproductive success and the species' populations (60 FR 35999–36010). However, successful captive breeding efforts, the banning of certain organochlorine pesticides, and other recovery efforts have resulted in apparent, significant increases in eagle numbers on the continent. Special pressures on individuals in the southwestern United States include heat stress, nest parasites, and entanglement in fishing line debris from intense fishing pressure (60 FR 35999–36010).

A study of nests in Oregon identified the following causes of nest failures: pesticides (32%), proximity to nearest-neighbor breeding pairs (11%), infertile eggs (7%), nestling mortality (3%), human disturbance (2%), changes in members of a pair (1%), and unknown causes (21%) (Anthony et al. 1994).

Human recreational use of reservoirs and rivers occupied by bald eagles has been greatly studied (Stalmaster and Kaiser 1998). Territories have been abandoned after there has been disturbance from logging, recreational development, and other human activities near nests of the bald eagle (Thelander 1973). In northwest Washington, feeding activity was found to decline exponentially with increased recreational activity (Stalmaster and Kaiser 1998). Foot traffic caused the greatest flushing distance, but boat activities accounted for a greater proportion of the disturbances (Stalmaster and Kaiser 1998). Bald eagles are more likely to flush when approached by a human on foot than when approached by an automobile (Holmes et al. 1993). Spatial buffer zones are commonly used to protect nesting sites from disturbance; however, buffer zones for wintering eagles also could be effective if placed around sensitive foraging areas. From one study, a buffer zone that would prevent flushing by approximately 90% of the wintering individuals of the similar golden eagle would be set at 985 feet (Holmes et al. 1993). Although this study did not specify the bald eagle and studies were not conducted for bald eagles, presumably the buffer distance for wintering bald eagles might be set for at least as great as the golden eagle until further research determines a different distance is more beneficial.

Bald eagles have been shown to be susceptible to collisions with objects, including vehicles and power lines. These impacts have been noted as causing at least 21% of the mortalities in one study (Wood et al. 1990). Plastic and lead ingestion has also been noted as a significant source of illness and death in bald eagles (Kramer and Redig 1997). Berry et al. (1998) determined that the bald eagle is sensitive to urbanization, based on a study conducted in Boulder Open Space in the vicinity of Boulder, Colorado. Eagles were scarce at point-count stations in plots with approximately 5% to 7% urbanization; this species occurred on only one plot in 15 where urban uses exceeded 5% of the plot (Berry et al. 1998). Habitat loss through logging may also threaten the bald eagle.

5.2.2.2.2 HABITAT CHARACTERISTICS AND USE

Rangewide, bald eagles occur primarily at or near seacoasts, rivers, swamps, and large lakes (AOU 1998). It is considered a bird of aquatic ecosystems, but, within such areas, it must have an adequate food base, perching areas, and nesting sites to support it (Gerrard and Bortolotti 1988). Perching sites need to be composed of large trees or snags with heavy limbs or broken tops (USFS, pers. comm. 1999). The bald eagle nests in trees, rarely on cliff faces or with ground nests in treeless areas, and always relatively close to water with suitable foraging opportunities. The actual distance to water varies within and among populations of the bald eagle. In some cases, the distance to water is not as critical as the quality of the foraging area. The quality of the foraging area is defined by the diversity, abundance, and vulnerability of the prey base; the structure of aquatic habitat, such as the presence of shallow water; and the absence of human development and disturbance (Buehler 2000). Diurnal perch habitat is characterized by the presence of tall, easily accessible, often “super-canopy” trees”[7] adjacent to the shoreline foraging habitat. The perch-tree species used by the bald eagle are highly variable, including both coniferous and deciduous species, if present. Most perch trees are live trees, although dead trees may be preferred, if available. The bald eagle selects a wider range of tree species and sizes for perching than for nesting or roosting (Buehler 2000).

In winter, bald eagles often congregate at specific wintering sites that are generally close to open water and that offer good perch trees and night roosts. The bald eagle may roost communally in winter in dense, sheltered, remote conifer stands (Zeiner et al. 1990b). In Klamath National Forest, winter roosts were 10 to 12 miles from feeding areas (Spencer 1976). The bald eagle

[7] A “super-canopy” tree is a tree that is taller than the immediate surrounding trees that allows the eagle to build its nest in the shelter of the tree crown but still be above the other trees for easy access to the nest.

often concentrates in large numbers on the wintering grounds. The winter habitat suitability is defined by food availability, the presence of roost sites that provide protection from inclement weather, and the absence of human disturbance, although bald eagles will tolerate some human activity in areas of high prey availability. Perching habitat during the wintering season is characterized by the presence of tall trees located adjacent to foraging areas, similar to other times of the year (Buehler 2000).

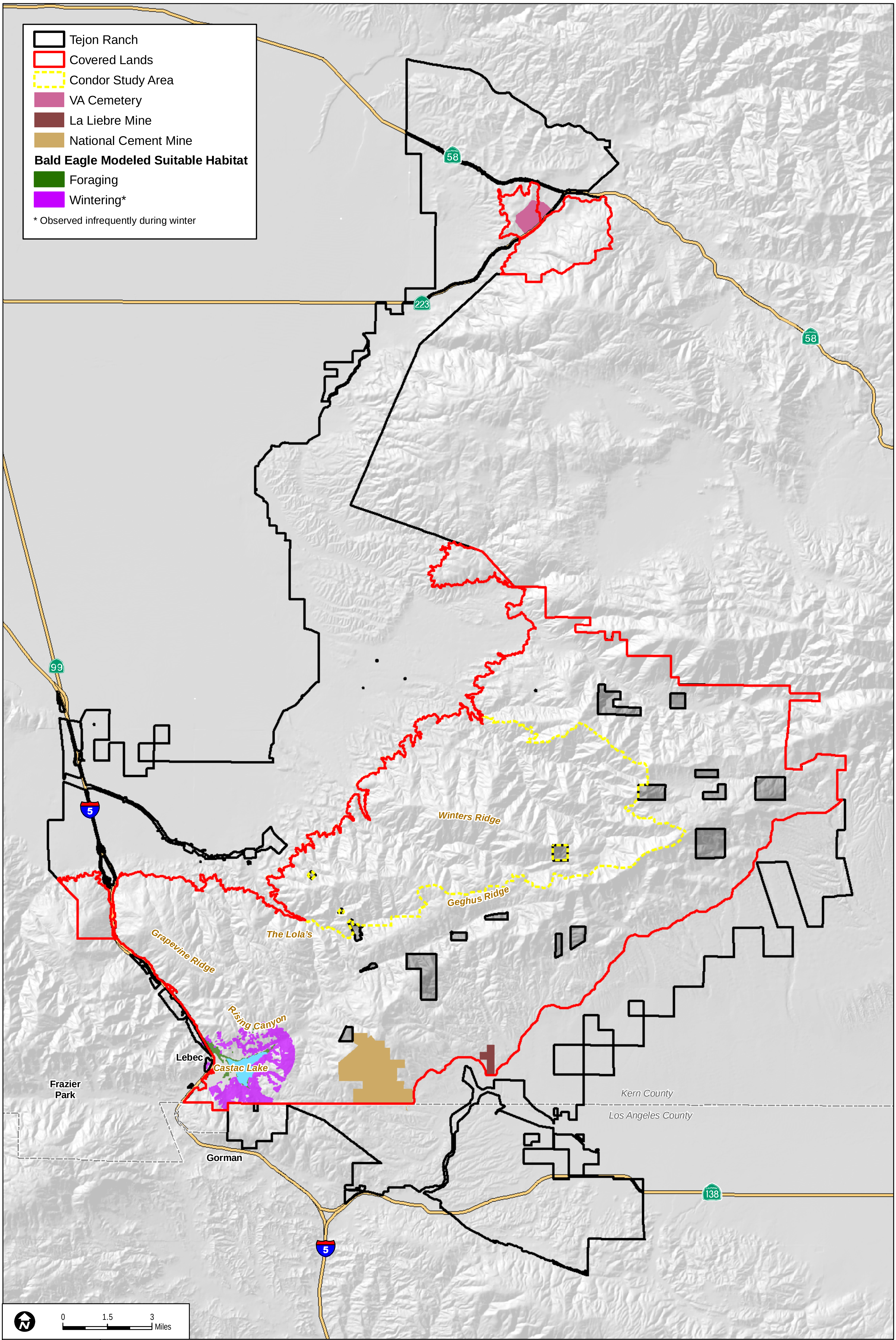
5.2.2.2.3 OCCURRENCE IN THE COVERED LANDS

Focused wintering and nesting surveys were conducted in the TMV Planning Area for the bald eagle in 2006 and 2007 (Dudek 2009). The wintering survey was conducted from December 2006 through February 2007 and the nesting survey was conducted in March, May, and June of 2007 (Dudek 2009). The surveys were conducted according to a protocol developed by Pacific Gas & Electric for USFWS. The surveys were conducted in suitable habitat supporting wintering/roosting, including deciduous or coniferous trees found near and along Castac Lake. Observations of other fish-eating birds, such as cormorants and osprey, were recorded to evaluate whether Castac Lake could support the bald eagle. The survey entailed scanning the lake and surrounding areas for bald eagles from several stationary locations. Suitable perching areas were observed using a road survey to look for eagles up to 1 mile from the lake. The nesting surveys were conducted on foot and by vehicle, and included searching for bald eagles and bulky nest structures along the lake and within a 1-mile buffer around the lake. See *Appendix D.1* for more detailed information on survey methods.

The focused surveys resulted in irregular observations of the species during the winter. In February 2007, a single individual was detected on two different days perching on the north side of Castac Lake. During other focused wildlife surveys in January 2008, a single adult and up to five immature bald eagles were also incidentally observed adjacent to Castac Lake. Nesting individuals were not detected in the TMV Planning Area in the spring and summer of 2007. Bald eagle was not observed on the site during prior surveys between 1999 and 2004 (Impact Sciences, Inc. 2004) or in 2005 (Jones and Stokes 2006a). The survey data indicate that bald eagle uses Castac Lake and the immediate vicinity irregularly during the winter.

Suitable habitat for the bald eagle was modeled for Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitats were categorized as either wintering habitat or foraging habitat. Modeled suitable wintering habitat for bald eagle includes savannah, woodland, and riparian woodland within 1 mile of Castac Lake that may provide roosting opportunities. Modeled suitable foraging habitat includes lake, riparian/wetland, and wetland within 1 mile of Castac Lake.

Modeled suitable habitat within Covered Lands for bald eagle is shown in *Figure 5-7, Bald Eagle Modeled Suitable Habitat*. A total of 518 acres of foraging habitat and 1,438 acres of wintering habitat for bald eagle was modeled on Covered Lands.



SOURCE: TRC 2007

FIGURE 5-7
Bald Eagle Modeled Suitable Habitat

Draft Tehachapi Uplands MSHCP

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5.2.2.3 BURROWING OWL

The burrowing owl (*Athene cunicularia*) is a small, ground-dwelling owl that occurs in natural open habitats, such as grasslands and deserts, but is also found in agricultural and suburban areas. Males and females are approximately the same size, measuring from 7.7 to 9.8 inches (19.5 to 25.0 centimeters) in length and weighing about 5.3 ounces (150 grams). Burrowing owls are generally brown overall, are short-tailed and long-legged, and have a rounded or flat head lacking ear tufts (Haug et al. 1993). Burrowing owls have a pale white eyebrow stripe and lemon-yellow irises, and adults generally have white underparts with buffy brown barring (Haug et al. 1993; Sibley 2000). Burrowing owls are the only small owl likely to be seen perched in the open in daylight (Sibley 2000). Juveniles are similar to adults, but are unstreaked to lightly streaked, with light to brownish buff below, and have more pale secondary coverts (Klute et al. 2003).

As many as 18 subspecies of burrowing owl are recognized, seven of which occur in North and Central America. Subspecies have not been evaluated using modern taxonomic techniques, but subspecies are generally geographically distinct and presumably isolated (Haug et al. 1993). Burrowing owls in California belong to the western burrowing owl (*A. cunicularia hypugaea*) subspecies, whose historical breeding range extended from southwestern and south–central Canada southward through the Great Plains and western United States and south to central Mexico.

5.2.2.3.1 STATUS AND DISTRIBUTION

Regulatory History

The burrowing owl is not a state- or Federally threatened or endangered species, but is designated by CDFG as a California Species of Special Concern due to declining population levels, limited ranges, and/or continuing threats (CDFG 2011a). Burrowing owl is also protected under the Federal MBTA (16 U.S.C. 703–712). In April of 2003, the Santa Clara Valley Audubon Society, Center for Biological Diversity, Defenders of Wildlife, San Bernardino Valley Audubon Society, Tri-County Conservation League, and California State Park Rangers Association petitioned to list the western burrowing owl under California's Endangered Species Act; however; the petition was denied at the time.

Natural History

Burrowing owls are opportunistic feeders, primarily feeding on arthropods, small mammals, and birds, and often need short grass, mowed pastures, or overgrazed pastures for foraging (Haug et al. 1993). Burrowing owls are primarily active at dawn and dusk in their foraging habits but hunting has been observed throughout the day (Thomsen 1971; Marti 1974). Insects are often taken during daylight whereas small mammals are taken more often after dark (Haug et al. 1993). Burrowing owls are aided by keen binocular vision (Bates 2006). According to Bates

(2006), "burrowing owls hunt by walking, running, hopping along the ground, flying from a perch, hovering, particularly over tall vegetation, and fly-catching in midair."

Burrowing owls are active night and day, often perching in open sunlight in the early morning and moving to shade or burrows in the heat. The burrowing owl is considered a semi-colonial species that often forms loose colonies. The range of distances between nest burrows varies and has been documented from 2,950 feet (900 meters) to less than 46 feet (14 meters) (Haug et al. 1993). Individuals of the more northern migratory populations tend to be solitary during the winter, whereas residents remain paired year-round. Haug et al. (1993) suggest that burrowing owls exhibit high site fidelity and reuse burrows year after year; however, recent studies indicate site fidelity to be low (Holroyd 2008).

Breeding occurs from March through August, with a peak in April and May. In migratory populations, western burrowing owls arrive on the breeding areas either singly or paired. On arrival the males occupy burrows, prepare them for use, and begin courtship and territorial behavior. According to Haug et al. (1993), non-migratory owls retain their pair bonds throughout the year (Haug et al. 1993). The clutch size is six to 11 eggs, with an average of seven to nine eggs; this clutch size may increase to the north. The young emerge from the burrow at about 2 weeks and fly after about 4 weeks (Zarn 1974). Martin (1973) reported 95% of the young fledged with a mean reproductive success of 4.9 young per pair.

Burrowing owls are subject to predation by mammals including badgers and domestic cats, while eggs and young may be taken by opossums, weasels, skunks, and dogs (Haug et al. 1993). Burrowing owl has been found as prey remains in Swainson's hawk (*Buteo swainsoni*) and ferruginous hawk (*B. regalis*) nests. Other raptors may also prey upon burrowing owl, including merlin (*Falco columbarius*), prairie falcon (*F. mexicanus*), peregrine falcon, great horned owl (*Bubo virginianus*), red-tailed hawk (*B. jamaicensis*), Cooper's hawk (*Accipiter cooperii*), and American crow (*Corvus brachyrhynchos*) (Haug et al. 1993).

Distribution and Population Trends

In many parts of the United States, the western burrowing owl's breeding range has been reduced, and it has been extirpated from certain areas, including western Minnesota, eastern North Dakota, Nebraska, and Oklahoma (Bates 2006), but the species is still widely distributed in western North America (Gervais et al. 2008). The winter range is much the same as the breeding range, but the majority of western burrowing owls that breed in Canada and the northern United States are believed to migrate south during September and October and north from March into the first week of May. Therefore, individuals observed in southern portions of the range during the winter may include both resident and migratory individuals (Haug et al. 1993). The subspecies occurring in Florida and Southern California are predominantly non-migratory (Thomsen 1971). The western burrowing owls in Northern California are believed to migrate (Coulombe 1971).

Of 24 jurisdictions in the western United States, 46% reported a population size between 1,000 and 10,000 pairs, and 33% reported between 100 and 1,000 pairs. No jurisdiction reported an increase, and 54% reported their owl population was probably declining (Haug et al. 1993).

Within the state, according to a USFWS Status Report and Conservation Plan for Burrowing Owls (USFWS 2002b),

> California supports one of the largest resident and winter populations of burrowing owls within the United States. The distribution of burrowing owls has changed considerably since introduction of industrial agriculture and increased urbanization, reflecting both losses and gains in local populations. Surveys conducted during 1991 to 1993 reported greater than 9,000 breeding pairs. Most of the burrowing owls occurred in the Imperial and Central Valleys, primarily in agricultural areas.

The number of western burrowing owl breeding pairs in central, western, and Southern California has drastically declined in the last 50 years; during the 1980s, the decline was probably greater than 70% (DeSante et al. 1997). According to Gervais et al. (2008), while the overall breeding range in California hasn't changed substantially, the location distribution within the overall range has changed considerably since introduction of industrial agriculture and increased urbanization, reflecting both losses and gains in local populations. In regions undergoing rapid development along the central and southern coastal region, local burrowing owl populations have declined or been extirpated. In contrast, very large breeding populations remain in the Central and Imperial Valleys in agricultural areas on private lands (Gervais et al. 2008).

Reasons for Decline

Klute et al. (2003) lists the elimination of burrowing mammal populations through control programs and habitat loss as the primary factor responsible for declines of burrowing owls. Other reasons for decline listed include habitat fragmentation, predation, illegal shooting, and pesticides and other contaminants. Burrowing owls are relatively tolerant of human activity, but are susceptible to human-related impacts, such as shooting and burrow destruction, while "artificially enhanced populations of native predators (e.g., gray foxes, coyotes) and introduced predators (e.g., red foxes, cats, dogs) near burrowing owl colonies are also problematic" (Bates 2006). Burrowing owls occur in large numbers across agricultural areas in the Central and Imperial Valleys and are likely to be impacted by changes in agricultural practices, particularly water conveyance (Bates 2006). Agricultural operations, such as disking of fallow fields and road and ditch maintenance, also can destroy burrows (Gervais et al. 2008). Survival and reproductive success were apparently negatively impacted by direct toxicity when Carbofuran, a carbamate insecticide, was sprayed over nest burrows (Bates 2006). Indirect mortality due to contaminated prey may be significant but is unknown to date (Haug et al. 1993). As noted above, use of rodenticides for ground squirrel control may reduce available burrows. Emerging diseases such as West Nile virus may also be a threat, but little data are available (Gervais et al. 2008). A ranking of the most important threats to the species included loss of habitat, reduced burrow availability due to rodent control, and pesticides (James and Espie 1997).

5.2.2.3.2 HABITAT CHARACTERISTICS AND USE

In California, western burrowing owls are year-long residents of flat, open, dry grassland and desert habitats at lower elevations (Bates 2006). Burrowing owl nests in California have been observed at elevations from 200 feet below sea level at Death Valley and up to 12,000 feet amsl at the Dana Plateau in Yosemite (Bates 2006). They can inhabit annual and perennial grasslands and scrublands characterized by low-growing vegetation. They may be found in areas that include trees and shrubs if the cover is less than 30% (Bates 2006); however, they prefer treeless grasslands. Although burrowing owls prefer large, contiguous areas of treeless grasslands, they have also been known to occupy fallow agriculture fields, golf courses, cemeteries, road allowances, airports, vacant lots in residential areas and university campuses, and fairgrounds when nest burrows are present (Bates 2006; Haug et al. 1993). They typically require burrows made by fossorial mammals, such as California ground squirrels (*Spermophilus beecheyi*). The availability of numerous small mammal burrows is a major factor in determining whether an area with apparently suitable habitat will support burrowing owls (Coulombe 1971). Burrowing owls rarely use areas unoccupied by colonies of burrowing mammals (Zarn 1974).

5.2.2.3.3 OCCURRENCE IN THE COVERED LANDS

Surveys for the burrowing owl were conducted in the TMV Planning Area between April 17 and June 27, 2007, and conformed to the protocols described in the *Staff Report on Burrowing Owl Mitigation* (CDFG 1995). Surveys were conducted within suitable habitat composed primarily of non-native and native grasslands within the site. Biologists walked approximately 100-foot transects throughout suitable habitat and assessed whether each potential burrow that was observed exhibited evidence of burrowing owl (i.e., feathers, whitewash, pellets, insect remains, and tracks). No burrows were found on site that showed evidence of use by burrowing owls. No breeding, resident, or wintering burrowing owls were detected on site during the focused surveys. One migrant burrowing owl was observed in October 2007 during surveys for the California condor (*Gymnogyps californianus*) (Dudek 2009). Based on these results, burrowing owls probably do not regularly winter or breed within Covered Lands. However, for the purpose of the TU MSHCP, it is assumed that burrowing owl could winter or nest within the Covered Lands because the site is located at the southern edge of the species' breeding range in the Central Valley and just west of its breeding range in the western Mojave Desert (Gervais et al. 2008). See *Appendix D.1* for more detailed information on survey methods.

Four CNDDB points are recorded for burrowing owl approximately 3 miles due east of Arvin, between the southern portion of the Tehachapi Mountain Uplands (San Joaquin Valley) side of the Covered Lands and the northern portion (CDFG 2011a). These observations are found in relatively flat grasslands (Dudek 2009). The burrowing owl also occurs in the Antelope Valley portion of Tejon Ranch, but outside the Covered Lands (USFWS, pers. comm. 2008).

Because the burrowing owl was observed during the winter in the TMV Planning Area, there is a high potential for the species to occur in the winter on Covered Lands. However, due to the relatively high elevation of the Covered Lands, the potential for burrowing owl to breed on Covered Lands is low. Based on observations made during TMV Planning Area surveys for this species, only a few individuals (fewer than five individuals) would be expected to occur during the winter on Covered Lands.

Suitable habitat for burrowing owl was modeled for all Covered Lands (see *Appendix D* for habitat modeling methods). Suitable primary and secondary breeding and foraging habitats for the burrowing owl occur within the Covered Lands. Primary suitable habitat is grassland and is defined as the main habitat used by burrowing owl and within which breeding and most other life history requirements are met. Secondary suitable habitat is scrub and is defined as habitat that is used by burrowing owl but may not be adequate to meet all or most life history requirements of the species; typically, secondary habitat alone is not adequate to support a species.

Modeled suitable habitat within Covered Lands for burrowing owl is shown in *Figure 5-8*, *Burrowing Owl Modeled Suitable Habitat*. A total of 24,944 acres of breeding/foraging habitat and 8,073 acres of secondary breeding/foraging habitat for burrowing owl was modeled on Covered Lands.

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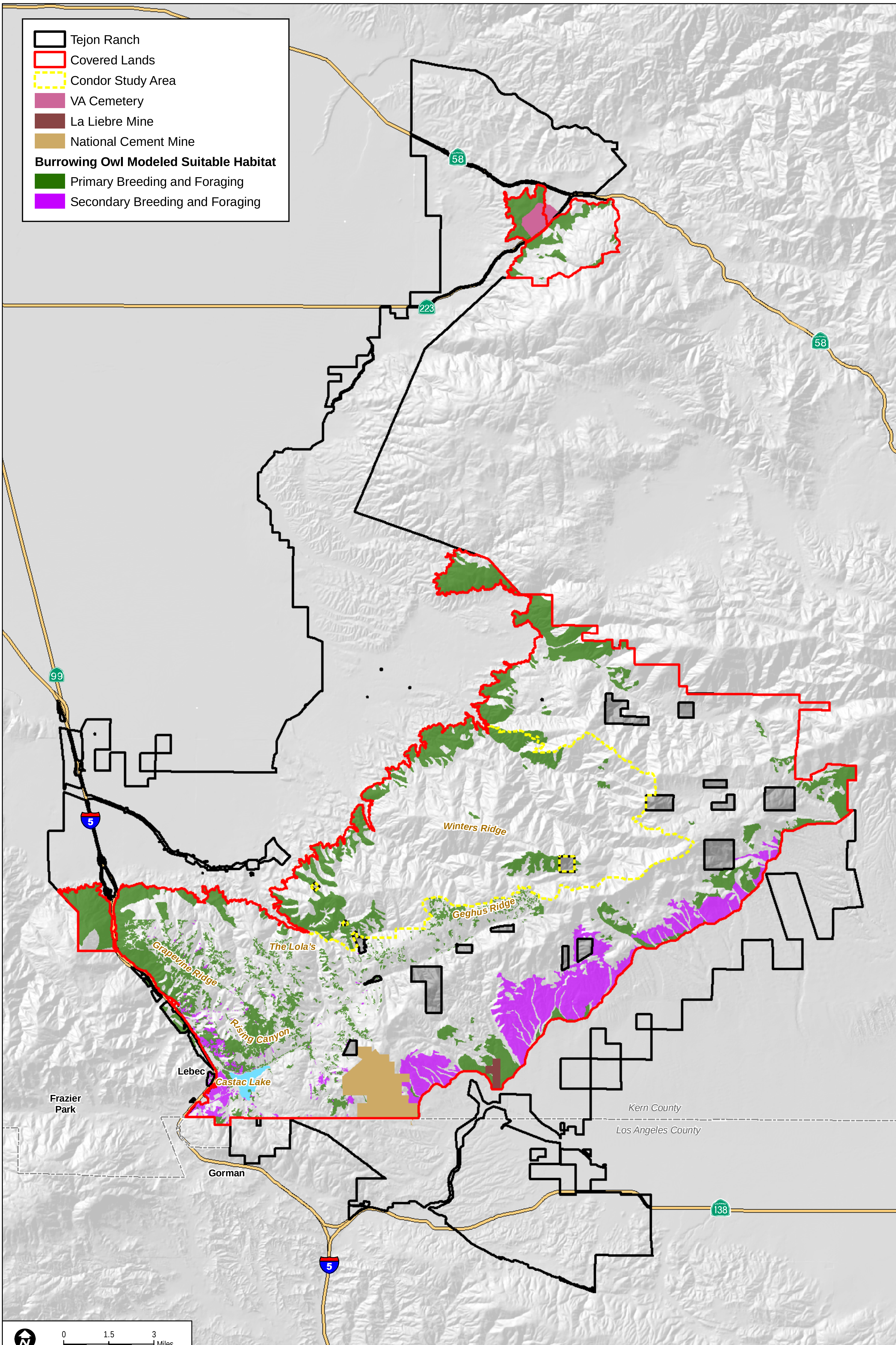

SOURCE: TRC 2007

FIGURE 5-8

Burrowing Owl Modeled Suitable Habitat

Draft Tehachapi Uplands MSHCP

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5.2.2.4 GOLDEN EAGLE

The golden eagle (*Aquila chrysaetos*) is a large, dark-brown raptor with long, broad wings (Kochert et al. 2002). Golden eagle length ranges from 28 to 33 inches, with a wingspan of 73 to 87 inches. The rear crown, nape, and sides of the neck are golden and the bars on the tail are gray. In adults, the rest of the body is dark brown with lighter rear underparts and upper wing coverts. Juveniles are distinguished from adults by their darker color and white at the base of the secondaries and inner primaries. The sexes are similar in appearance, although females are larger than males on average. Plumage is the same throughout the year (Kochert et al. 2002)

5.2.2.4.1 STATUS AND DISTRIBUTION

Regulatory History

The golden eagle is Federally protected under the Bald and Golden Eagle Protection Act, passed in 1940 to protect the bald eagle, and amended in 1962 to include the golden eagle (16 U.S.C. 668a–668d). It is also protected under the Federal MBTA (16 U.S.C. 703–712). The golden eagle is a California Species of Concern and is Fully Protected in the State of California (CDFG 2011a).

Natural History

The golden eagle eats primarily lagomorphs (hares, rabbits, and pikas) and rodents; it also takes other medium to large mammals, birds, reptiles, and some carrion (Johnsgard 1990; Olendorff 1976). The golden eagle is considered to be an opportunistic forager (Olendorff 1976). In Southern California, the prey of golden eagles is made up predominantly of the California ground squirrel and the Audubon cottontail (*Sylvilagus audubonii*) (Hoechlin 1976). The golden eagle occasionally preys on domestic calves and lambs. Within certain portions of its range, it may compete with ferruginous hawks for small mammals, and with California condors for carrion (Zeiner et al. 1990b).

The golden eagle requires a broad, open terrain for hunting. It soars approximately 100 to 300 feet above the ground in search of prey, or makes low, quartering flights, often 20 to 30 feet above ground. Occasionally it searches from a perch and flies directly to the prey (Carnie 1954). Sometimes it pirates food from other predators. Hunting in pairs is apparently common, with one member of the pair chasing the prey to exhaustion and the other swooping down to kill the prey (Terres 1980).

The golden eagle exhibits year-long, diurnal activity (Zeiner et al. 1990b). This species spends most of the day perched (78% to 85% of the day) and the remainder of the day in flight (Collopy and Edwards 1989).

Nest building can occur almost any time during the year (Brown 1976). Pairs may build more than one nest and attend them prior to laying eggs (McGahan 1968). Each pair can have up to 10 nests, but only two to three are generally used in rotation from one year to the next. Some pairs use the same nest each year, while others use alternate nests year after year, and still others apparently nest only every other year. The same nest may even be used by succeeding generations of eagles (Terres 1980).

The golden eagle builds a large platform nest, often 10 feet across and 3 feet in height, of sticks, twigs, and greenery. It breeds from late January through August, with a peak in March through July. The clutch size is one to three eggs, usually two eggs (McGahan 1968). Eggs are laid in early February to mid-May. The young birds hatch several days apart. The older, stronger eaglets often kill their smaller siblings (Terres 1980). The average incubation period lasts approximately 42 days, and the nestling period ranges from 45 to 81 days (Kochert et al. 2002). Parental care continues into August, and family groups remain together into November (Scott 1985).

Breeding success depends on local prey abundance. A 15-year study of golden eagles in Oregon found a mean of 1.08 young fledged per breeding territory, 1.7 young fledged per successful nest, and 51% overall nesting success (Thompson et al. 1982). Sexual maturity is generally reached in about 4 years, and the average lifespan of adults in the wild is approximately 10 years (Brown and Amadon 1968). After the young golden eagles have fledged, they remain in the vicinity of the nest for about 2 weeks (Brown and Amadon 1968). In some populations, they are thought to be dependent on parental assistance for about 3 months after learning to fly, and normally separate from the parents by October. The young often appear near the nest site in the early part of the following breeding season and immature golden eagles sometimes frequent a nest site for several years before they finally breed there.

Golden eagles defend nest areas from conspecifics (i.e., members of the same species) and appear to defend part of their home range; however, there can be substantial overlap between the home ranges of adjacent pairs (Scott 1985). The home range of the golden eagle is probably the same as the territory (Zeiner et al. 1990b). The size of the home range is related to prey density and availability, and the openness of terrain (Zeiner et al. 1990b). As examples, home range size has been estimated to average 8.92 square miles (5,709 acres) in Utah (Smith and Murphy 1973) and 12.64 square miles (8,092 acres) in southwestern Idaho (Collopy and Edwards 1989). Radiotelemetry studies of golden eagles in the Snake River Birds of Prey National Conservation Area in Idaho, however, demonstrated that home ranges can be seasonally quite variable, ranging from 0.7 square mile (469 acres) to 32.15 square miles (20,575 acres) during the breeding season, and from 5.29 square miles (3,384 acres) to 656.09 square miles (419,900 acres) during the non-breeding season (Marzluff et al. 1997). Territories remain occupied in years of low prey availability, even when golden eagles do not breed. Territorial boundaries are generally static, changing little from year to year (Marzluff et al. 1997).

Distribution and Population Trends

The golden eagle has a Holarctic distribution (i.e., northern continents), extending as far south as north Africa, Arabia, and the Himalayas in the Old World, and Mexico in North America. It is a partial migrant within this distribution, with the northern breeding birds migrating south in winter, while those of more temperate climates remain all year round (Brown and Amadon 1968). Golden eagles primarily occur in the western regions of North America and breed locally from Alaska southward to northern Baja California and northern Mexico and eastward to the western Great Plains. The species winters from southern Alaska and southern Canada southward through the breeding range (Johnsgard 1990).

Recent population estimates for golden eagle are lacking (Kochert et al. 2002). Olendorff et al. (1981) estimated over 63,000 wintering individuals in 16 western states. Braun et al. (1975) estimated over 100,000 individuals in North America in the 1970s. Estimates of breeding pairs in two western states include 1,200 in Nevada (Herron et al. 1985) and 500 in California (Thelander 1974).

This species is sparsely distributed throughout most of California, occupying primarily mountain, foothill, and desert habitats (Zeiner et al. 1990b). This species may be more common in Southern California than in northern regions. It ranges from sea level up to 11,500 feet amsl (Grinnell and Miller 1944). Golden eagles are mostly resident, but may move downslope for the winter or upslope after the breeding season. Some individuals migrate into California for the winter (Zeiner et al. 1990b). Although the golden eagle was formerly considered common within suitable habitats in California (Grinnell and Miller 1944), the species was more recently judged to be uncommon throughout much of California (Garrett and Dunn 1981), with only about 500 breeding pairs in California in the 1970s (Thelander 1974). The golden eagle avoids settled areas and, therefore, has almost certainly declined in California within the past century due to loss of large, unfragmented habitat areas (Grinnell and Miller 1944). For example, nesting populations in San Diego County decreased from an estimated 85 pairs in 1900 to 40 occupied territories in 1999 due to extensive residential development (Kochert et al. 2002).

Reasons for Decline

In California, loss of golden eagle foraging and nesting habitat is largely due to the loss of grasslands to agriculture and urbanization. Additional threats to this species are human disturbance of nest areas leading to desertion of the nest in early incubation, urbanization, poaching, and electrocution from high-tension wires (Remsen 1978; Thelander 1974). Other sources of direct golden eagle fatalities include wind turbine strikes and lead poisoning (Thelander 1974), as well as vehicle collisions (Phillips 1986). Of 61 golden eagles radio-tagged and recovered in the Diablo Range, which is part of the Pacific Coast Ranges in western California, from January 1994 to December 1997, 37% were killed by turbine strikes, 16% by electrocution, and 5% by lead poisoning (Hunt et al. 1998). Shootings (2%), car strikes (5%), botulism (2%), territorial fights with other eagles (5%), collision with fences (3%), fledging mishaps (10%), and other unknown factors (15%) account for the remaining bird fatalities. More than 270 eagles were electrocuted in North America between 1986 and 1996 (Harness and Wilson 2001); immature eagles are most susceptible to electrocution when landing on power poles (Kochert et al. 2002). Elevated blood-lead levels (less than 0.20 parts per million), likely from ingested hunter ammunition, occurred in 36% of 162 eagles from Southern California from 1985 to 1986 (Pattee et al. 1990). Weather also may cause stress to golden eagles during sensitive periods. Studies have documented heat stress as a significant mortality factor for nestlings (Mosher and White 1976), and an inverse correlation exists between nesting success and the number of days with temperatures greater than 32°C (89.6°F) (Steenhof et al. 1997).

The golden eagle is particularly sensitive to human disturbance and to land use changes that disrupt natural food supplies and nesting sites. An increase in human disturbance of a nest area and urbanization may result in abandonment of the nest, thereby threatening the species' reproductive success (Thelander 1974). Eagles readily abandon nesting areas that are being encroached upon by human uses, and have been observed to flush from the nest area when humans approach from as far away as 0.5 mile (Bittner, pers. comm. 1998). Human developments on ridgetops within view of nesting sites may also cause nest abandonment (Camp et al. 1997). In a study of golden eagles in San Diego County, the count of residences was shown to have a significant correlation to the number of abandoned golden eagle territories (Richardson and Miller 1981).

The issue of raptor electrocutions on power lines started receiving serious attention in the early 1970s. Several studies identified how raptors, including golden eagles, were being electrocuted and recommendations have been established to reduce the risk (Olendorff et al. 1981; Avian Power Line Interaction Committee 2006). Single-phase poles, three-phase poles, and pole-mounted transformers all pose an electrocution threat to raptors but can be retrofitted with various devices to reduce the risk.

5.2.2.4.2 HABITAT CHARACTERISTICS AND USE

Rangewide, golden eagles occur in open country (e.g., tundra, open coniferous forest, desert, and barren areas), especially in hills and mountainous regions (AOU 1998). Golden eagles typically are not found in heavily forested areas or on the immediate coast and are almost never detected in urbanized environments (Grinnell and Miller 1944; Garrett and Dunn 1981). The golden eagle preferred territory sites have a favorable nest site, a dependable food supply, and broad expanses of open country for foraging. Hilly or mountainous country that provides updrafts that facilitate takeoff and soaring are occupied more than flat habitats (Johnsgard 1990). In the interior central Coast Ranges of California, golden eagles are often found in open grasslands and oak savannah, but also occupy oak woodland and open shrublands (Hunt et al. 1998). Within Southern

California, the species prefers grasslands, brushlands (coastal sage scrub and sparse chaparral), deserts, oak savannahs, open coniferous forests, and montane valleys (Garrett and Dunn 1981).

Nesting of the golden eagle is primarily restricted to rugged, mountainous country, with canyons and escarpments (Garrett and Dunn 1981; Johnsgard 1990; Call 1978). Secluded cliffs with overhanging ledges and large trees are used for nest sites (Zeiner et al. 1990b). There is a high frequency of nest locations on granite cliffs. Approximately 85% of all nest areas overlook, or are on the opposite side of, the ridge from large valleys or areas of relatively low topographic heterogeneity and open vegetation (Scott 1985). Most nests are located on cliffs or trees near forest edges or in small stands near open fields (Bruce et al. 1982; Hunt et al. 1998). Nest locations tend to be more closely associated with topographic heterogeneity than with a particular vegetation type (Call 1978). Some nests occur in Douglas-fir (*Pseudotsuga menziesii*), pines (*Pinus* spp.) or other large trees (McGahan 1968), such as several species of oak (*Quercus* spp.), foothill pine (*Pinus sabianiana* and *P. coulteri*), California bay laurel (*Umbellularia californica*), eucalyptus (*Eucalyptus* spp.), and western sycamore (Hunt et al. 1998).

The golden eagle needs a broad expanse of open country for hunting, including grasslands, deserts, savannahs, and early successional stages of forest and shrub habitats (Johnsgard 1990). Foraging takes place over large areas of open chaparral or coastal sage scrub as well. In parts of Idaho, golden eagles have been shown to select areas with abundant and large shrub patches, which provide preferential jackrabbit habitat (Marzluff et al. 1997).

5.2.2.4.3 OCCURRENCE IN THE COVERED LANDS

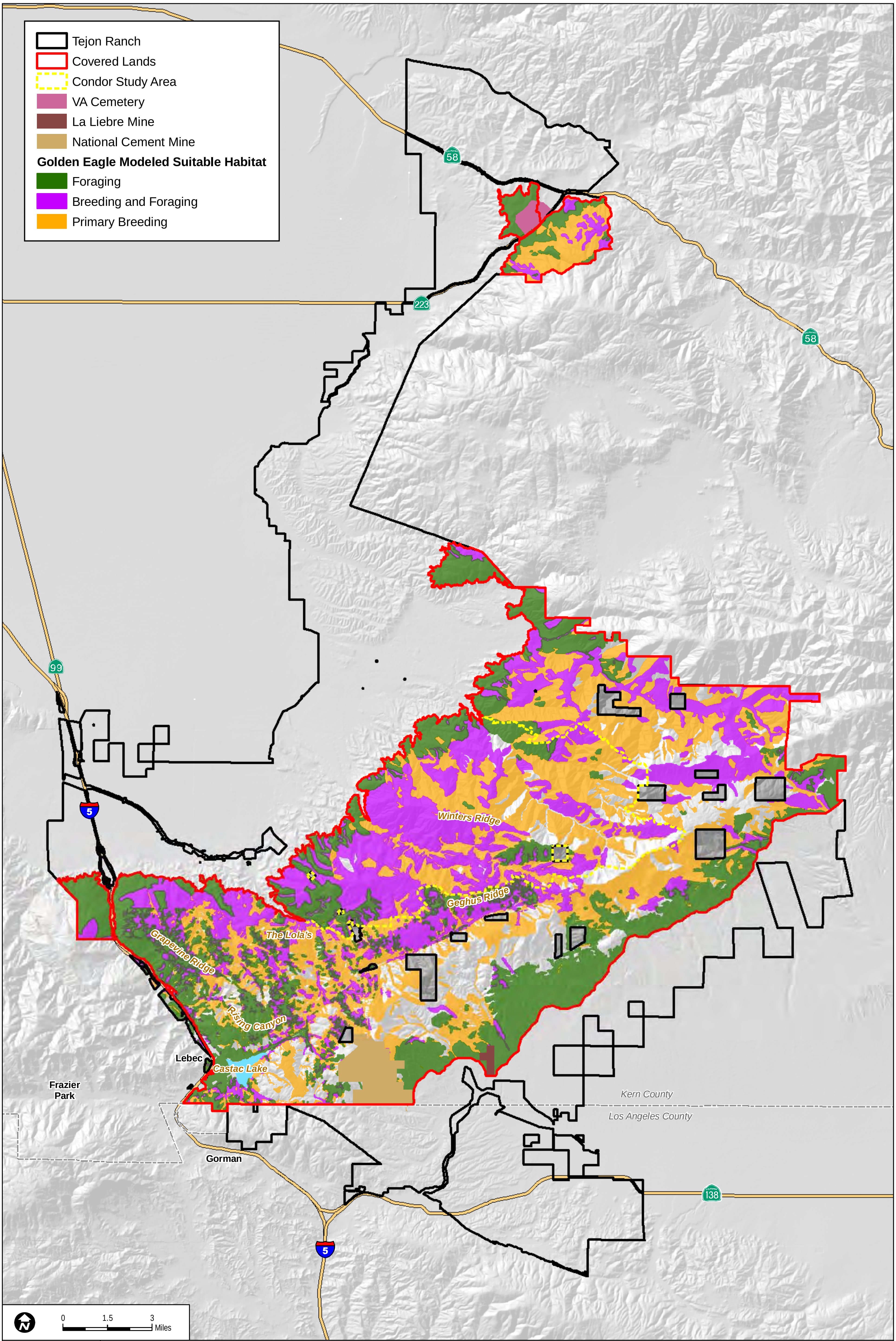
Surveys for special-status breeding raptors, including golden eagle, were conducted in the TMV Planning Area by Dudek during two time periods in 2007 (Dudek 2009). Raptor surveys were conducted using the methods described by Fuller and Mosher (1987), including early season driving and road surveys to identify nest locations and follow-up driving, road, or pedestrian surveys to identify additional locations and provide nesting success information. The surveys focused on oak woodlands. In addition, chaparral was surveyed by road to supplement the oak woodland surveys. The first set of surveys was conducted early in the nesting period, with a total of 18 driving/road surveys conducted from March 6 through March 30, 2007. In general, most deciduous trees had not leafed out, so raptor nests were very visible during this period. The second set of approximately 18 road and walking surveys was conducted from June 4 through July 6, 2007. See *Appendix D.1* for more detailed information on survey methods.

Golden eagles have been reported regularly in the TMV Planning Area based on data collected since 1999 (Impact Sciences, Inc. 2004; Jones and Stokes 2006a; Dudek 2009). Most recently, golden eagles were documented in the TMV Planning Area from 2006 to 2008 in and around Rising, Silver, Short, and Beartrap Canyons and on Geghus, Skinner, Rising, and Squirrel Ridges (Dudek 2009). This species is a documented breeding resident in the TMV Planning Area. Three active nest sites were observed during surveys in 2005 (Jones and Stokes 2006a) and also in 2007

(Dudek 2009). In 2007, all three nests were located in large oak trees in canyon live oak woodlands and forests: one overlooking Rising Canyon, west of the gas line easement and south of the main road through Rising Canyon; one in a drainage northwest of Squirrel Canyon; and one near the TMV Planning Area's southeastern boundary, south of Poleline Ridge overlooking an unnamed canyon (Dudek 2009). A fourth nest located on a slope above Skinner Canyon near the southern and southeastern border of the TMV Planning Area was determined to be inactive, and subsequent visits to this nest since 2007 during the nesting season have not identified any activity at this nest. A fifth nest located first in 2005 (Jones and Stokes 2006a) in Johnson Canyon north of the Skinner Canyon site was determined in 2007 to have been destroyed, likely by inclement weather. Many of the observations of golden eagles foraging, perching, and flying were concentrated around the active nest sites, especially the nests near Rising and Squirrel Canyons. In some instances, juveniles were documented far from the three active nest sites (no other nests were discovered), suggesting that these juveniles had fledged from one of the three active nests (either in 2007 or previous years) and flown to other areas where they were documented.

Suitable habitat for golden eagle was modeled on Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitats were categorized as: (1) primary nesting habitat, which serves only breeding functions; (2) nesting and foraging habitat, which serves both breeding and foraging functions; or (3) foraging habitat, which serves only foraging functions. Modeled suitable primary nesting habitat includes oak woodland and riparian woodland. Modeled suitable breeding and foraging habitat is savannah, and modeled suitable foraging habitat includes scrub, grassland, agriculture, wash, and riparian/wetland.

Modeled suitable habitat within Covered Lands for golden eagle is shown in *Figure 5-9, Golden Eagle Modeled Suitable Habitat*. A total of 48,019 acres of primary breeding habitat, 33,056 acres of breeding/foraging habitat, and 33,891 acres of foraging habitat for golden eagle was modeled for Covered Lands. However, because it is unlikely that all modeled suitable habitat would be saturated and because some modeled suitable habitat may not contain the microhabitat nesting criteria required by this species, not all modeled suitable habitat is expected to be occupied by golden eagle.



SOURCE: TRC 2007

FIGURE 5-9

Golden Eagle Modeled Suitable Habitat

Draft Tehachapi Uplands MSHCP

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5.2.2.5 LEAST BELL'S VIREO

The least Bell's vireo (*Vireo bellii pusillus*) is a member of the avian family *Vireonidae* and is taxonomically similar to crows and jays (*Corvidae*) and wood warblers, tanagers, buntings, and blackbirds (*Emberizidae*) (Brown 1993). Four subspecies of Bell's vireo have been recognized based on taxonomy (AOU 1957) and geographic separation (Hamilton 1962). The least Bell's vireo is a small vireo (51 FR 16474–16482) that is generally described as being dull ashy gray to green above, white to yellow below, with a light brownish gray on the breast (USFWS 1998). According to Unitt (1985), the four subspecies of Bell's vireo represent various gradations in color. Specifically, each subspecies is more brightly colored than the subspecies that occurs farther to the west, making least Bell's vireo more muted than the other three subspecies.

5.2.2.5.1 STATUS AND DISTRIBUTION

Regulatory History

The least Bell's vireo was state listed as endangered in 1980 and Federally listed as endangered by USFWS in 1986 (51 FR 16474–16482). USFWS made a final critical habitat designation for the least Bell's vireo in 1994 (59 FR 4845–4867). USFWS's least Bell's vireo critical habitat designation covers approximately 38,000 acres at 10 locations in six counties in Southern California: Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, and San Diego (59 FR 4845–4867). There are no critical habitat designations within or adjacent to the Covered Lands. The least Bell's vireo is also protected under the Federal MBTA (16 U.S.C. 703–712).

Natural History

Bell's vireo[8] is known to feed primarily on insects and spiders and, rarely, on fruit (Chapin 1925). Insects consumed include bugs, beetles, bees, wasps, snails, grasshoppers, moths, and butterflies (Chapin 1925). Feeding behavior largely consists of collecting prey from leaves or bark crevices while perched or hovering and, less frequently, by capturing prey by aerial pursuit (Kus and Miner 1989).

For the least Bell's vireo, foraging occurs primarily within willow (*Salix* spp.) stands or associated riparian vegetation, with forays into non-riparian vegetation, including chaparral and oak woodlands, later in the breeding season (Gray and Greaves 1984; Kus and Miner 1989). Least Bell's vireo is known to forage for prey on a variety of tree and shrub species, preferring black willow (*Salix gooddingii*), arroyo willow (*Salix lasiolepis*), and mulefat (*Baccharis salicifolia*) (USFWS 1998). Individuals are known to travel between 10 and 200 feet (a mean of

[8] Bell's vireo (Vireo bellii), which includes the subspecies least Bell's vireo, is referred to in this species account when documents cited included information on the species Bell's vireo but did not provide specific information on the subspecies least Bell's vireo.

60 feet) while foraging, with the majority of these destinations occurring within 98 feet of the edge of riparian vegetation (Kus and Miner 1989). Least Bell's vireo is known to forage in all vertical vegetation layers from ground level to 66 feet, but most feeding is concentrated in the lower vegetation layers between ground level and 20 feet (Kus and Miner 1989; Kus 2002).

The breeding season for least Bell's vireo is typically mid-March to September (51 FR 16474–16482). During this period, least Bell's vireo is known to breed almost exclusively within riparian habitats (USFWS 1998). Nesting sites are typically selected within structurally heterogeneous woodlands, forests, and scrub that support dense vegetation near the ground and dense horizontally separated vegetation higher up in the canopy (Goldwasser 1981; Gray and Greaves 1984; Kus 2002; RECON 1989). Quantitative and qualitative measures have thus far failed to identify distinguishing features between nest sites and other suitable habitat within a territory (Hendricks and Rieger 1989; Olsen and Gray 1989). Nests are typically suspended in forked branches of many different riparian species, with the least Bell's vireo showing no clear preference for any particular species (Nolan 1960; Barlow 1962; Goldwasser 1981). Because *Salix* spp. and mulefat are typically the most abundant species in vireo habitat, these species appear to be most commonly selected for nesting (Goldwasser 1981; Franzreb 1989). Nests appear to be used only once, with new nests constructed for failed or successive broods (Greaves 1987).

Predation is common in least Bell's vireo because of the close proximity of the nest to the ground (Franzreb 1989; Kus 1994). For example, Kus (1994) determined that 20 (83%) unsuccessful nests in the Tijuana River in a 1994 study were likely to have been preyed upon by birds, snakes, or mammals. Additionally, nest parasitism by the brown-headed cowbird (*Molothrus ater*) is one of the primary threats to successful reproduction in least Bell's vireo (USFWS 1998) and is discussed below.

Fledgling Bell's vireos expand their dispersal distances from about 30 feet the first day to approximately 200 feet several weeks after fledging (Hensley 1950; Brown 1993). This distance has been shown to increase to approximately 1 mile during the same breeding season (Gray and Greaves 1984). Studies by Kus and Greaves have provided estimates of extra-watershed dispersal rates and distances for least Bell's vireo, with approximately 20% dispersing outside their natal drainages over distances of 130 miles (USFWS 1998). Data collected by Kus also suggest that males are more likely to disperse from their natal sites than females (USFWS 1998).

Early data suggested that least Bell's vireo are strongly site-tenacious, returning to the same site in close proximity to previously occupied territories (Kus 2002; Greaves 1987, 1989). More recent data suggest that least Bell's vireo may change breeding sites and that additional study is needed (USFWS 1998).

Least Bell's vireo territory sizes range from 0.5 to 7.4 acres, with most averaging between 0.7 and 2.5 acres (USFWS 1998). Territories in Bell's vireo are maintained by threat and physical confrontation early in the breeding season, tapering to vocal warnings later in the season (Barlow 1964).

Distribution and Population Trends

The least Bell's vireo was once common and was the major breeding subspecies of Bell's vireo in California. It is endemic to California and northern Baja California and is now a rare, local, summer resident. In 1977–1978, 67 males or paired individuals were counted at 23 of 65 sites surveyed on the coastal slope of Southern California, and 23 males or paired individuals were counted at nine of 18 sites on the desert slope (Goldwasser et al. 1980; Garrett and Dunn 1981). The least Bell's vireo formerly was found in valley-bottom riparian habitats from Tehama County, California, southward locally to northwestern Baja California in the south, and as far east as Owens Valley, Death Valley, and along the Mojave River (Grinnell and Miller 1944). Except for a few outlying pairs, the subspecies is currently restricted to Southern California south of the Tehachapi Mountains and to northwestern Baja California (Garrett and Dunn 1981).

Zeiner et al. (1990b) summarize the distribution, abundance, and seasonality of the least Bell's vireo within California as follows. Least Bell's vireo was formerly a common and widespread summer resident below about 2,000 feet amsl in the western Sierra Nevada, throughout the Sacramento and San Joaquin Valleys, and in the coastal valleys and foothills from Santa Clara County south (Zeiner et al. 1990b). Also, it was common in coastal Southern California from Santa Barbara County south, below about 4,000 feet amsl east of the Sierra Nevada, in Owens and Benton Valleys, along the Mojave River and other streams at the western edge of southeastern deserts, and along the entire length of the Colorado River (Grinnell and Miller 1944). Bell's vireo (subspecies uncertain) also breeds in at least two sites along the Amargosa River near Tecopa, Inyo County (Garrett and Dunn 1981).

Usually, least Bell's vireo arrive from the Mexican wintering areas by the end of March to early April and depart by the end of September (Zeiner et al. 1990b). Males usually arrive on the breeding grounds a few days before the females. At the end of the nesting season, stragglers have been known to remain in breeding areas as late as November (USFWS 1998).

USFWS (2006a) conducted a 5-year status review of the least Bell's vireo that compiled comprehensive survey data for 5-year increments from 1977 to 2005.[9] As shown in *Table 5-1, Estimate of Least Bell's Vireo Territories by County*, the least Bell's vireo breeding population in the United States has increased about tenfold since its Federal listing as endangered in 1986, from about 291 to about 2,968 known territories (51 FR 16474–16482; USFWS 2006a). As

[9] It should be noted that these data represent a minimum estimate of least Bell's vireo territories because they are a composite of multiple surveys covering different reaches and may exclude large stretches of suitable habitat that were not surveyed (USFWS 2006a); in other words, these data do not represent a single snapshot of the entire occupied vireo range.

indicated in *Table 5-1*, the breeding population has grown during each 5-year period since the original Federal listing, although the rate of increase has slowed over the last 10 years. Population growth in terms of percentages and numbers has been greatest in San Diego and Riverside Counties, with lesser but significant increases in Orange, Ventura, San Bernardino, and Los Angeles Counties (USFWS 2006a). Only Santa Barbara County appears to have experienced a significant decline in territories, dropping from a high of 57 territories in 1986–1990 to 12 in the 1996–2000 and 2001–2005 time periods. As shown in *Table 5-1* (note bold text), there is at least one known least Bell's vireo territory in Kern County and one pair successfully nested in the San Joaquin River National Wildlife Refuge in 2006 (USFWS 2006a).

Based on the status review, the two largest concentrations of least Bell's vireo territories are in the Santa Ana River (including Prado Basin) and on Camp Pendleton/Santa Margarita River (USFWS 2006a). San Diego County, including Camp Pendleton, has the greatest total number of confirmed territories, with the largest concentrations in the Santa Margarita River, San Luis Rey River, Tijuana River, and Anza-Borrego Desert State Park (USFWS 2006a). The Santa Clara River in Los Angeles and Ventura Counties also supports a large concentration of territories, with 119 territories in 2001 (USFWS 2006a).

Table 5-1. Estimate of Least Bell's Vireo Territories by County[1]

Estimate of Least Bell's Vireo Territories (and Percentage of the Total Population) for a Given Range of Years by County[2]					
County	1977–1985[3]	1986–1990	1991–1995	1996–2000	2001–2005
San Diego[4]	223 (77%)	401 (76%)	1,118 (78%)	1,899 (76%)	1,609 (54%)
Riverside[5]	29 (10%)	50 (9%)	223 (16%)	395 (16%)	898 (30%)
Orange	1 (<1%)	3 (1%)	16 (1%)	68 (3%)	177 (6%)
San Bernardino	0 (0%)	2 (<1%)	5 (<1%)	20 (1%)	87 (3%)
Los Angeles	6 (2%)	1 (<1%)	4 (<1%)	13 (1%)	56 (2%)
Ventura[6]	5 (2%)	8 (2%)	35 (2%)	86 (3%)	117 (4%)
Santa Barbara[7]	26 (9%)	57 (11%)	32 (2%)	12 (<1%)	12 (<1%)
Inyo	0 (0%)	4 (1%)	5 (<1%)	0 (0%)	11 (<1%)
Kern	**0 (0%)**	**0 (0%)**	**1 (<1%)**	**0 (0%)**	**0 (0%)**
Monterey	0 (0%)	3 (1%)	0 (0%)	0 (0%)	0 (0%)
San Benito	1 (<1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Stanislaus	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (<1%)
Total	**291**	**529**	**1,439**	**2,493**	**2,968**
Percent Increase from Previous Period	—	82%	172%	73%	20%
Percent Increase since Listing	—	82%	394%	753%	920%

1 Reproduced from USFWS (2006a).
2 Estimates based on composite of surveys across the specified range of years.
3 From the original listing (51 FR 16474–16482).
4 Approximately 50% or greater from Camp Pendleton.
5 Approximately 90% or greater from the Santa Ana River and its tributaries.
6 Approximately 90% or greater from the Santa Clara River.
7 Approximately 90% or greater from the Santa Ynez River.

USFWS has attributed the increase in the least Bell's vireo population to "improvements in habitat abundance and quality and effective cowbird control" (USFWS 2006a, p. 18). According to USFWS (2006a), these improvements have occurred for several reasons:

1. The Federal listing of the least Bell's vireo (51 FR 16474–16482) helped raise awareness of the importance of conserving riparian habitat.

2. Several Natural Community Conservation Planning/Habitat Conservation Plan efforts include conservation and management of least Bell's vireo habitat.

3. Additional protections have occurred on military lands (e.g., Camp Pendleton) through the Sikes Act Improvement Act of 1997 (16 U.S.C. 670a et seq.) and the 2006 Memorandum of Understanding between USFWS and the U.S. Department of Defense (71 FR 51580–51585).

4. The wetlands regulations under Sections 401/404 of the Clean Water Act and Section 1600 of the California Fish and Game Code have been more effectively implemented.

5. Public/private partnerships with the specific mission of conserving riparian habitats and migratory birds, including the least Bell's vireo, have been formed.

Reasons for Decline

The major threats to least Bell's vireo include the loss and degradation of riparian habitat and nest parasitism by the brown-headed cowbird (USFWS 1998; 51 FR 16474–16482). The decline of the least Bell's vireo has coincided with the reduction of riparian habitat throughout its range. In the Central Valley, more than 95% of the riparian woodland habitat that existed in the 1850s has been eliminated (USFWS 1998) and much of the remaining habitat is in a disturbed or degraded condition (USFWS 1998). Coinciding with the historical and economic development of California, habitat removal or alteration has occurred as the result of a variety of causes, including clearing for agricultural purposes, impounding stream channels for water resource use, flood control and channelization of rivers, livestock grazing, and urbanization (USFWS 1998). In addition, least Bell's vireo habitat has been impacted by the loss and modification of hydrological and fluvial processes, sand mining, groundwater withdrawal, mosquito control, infestation of non-native plant species (e.g., giant reed), loss of native habitat buffers, and edge effects from upland development (Brown 1993).

Coincident with the conversion of much of riparian woodlands to agricultural and other uses, the range of the brown-headed cowbird expanded to include the Pacific Coast of North America. As stated earlier, brood parasitism by the brown-headed cowbird also threatens the least Bell's vireo because cowbirds lay their eggs in the nests of vireos and other songbirds (Brown 1993). The cowbird often removes a number of the host's eggs and replaces them with an equal number of its own eggs. Cowbird eggs require a relatively short incubation period; thus, the young cowbird hatches earlier than the host's eggs. The effects of brood parasitism include reducing nest success rates and egg-to-fledgling rates and delaying successful fledging. A common response to parasitism is abandonment of the nest by adult vireos. The success rate of re-nesting is often reduced and there may be inadequate time to prepare for migration. In California, parasitism rates range from 50% to 80%; this is considered to be a high parasitism rate (Brown 1993).

Noise is also a potential threat to nesting least Bell's vireo. The impact of noise on avian species varies among species and depends on source, duration, and schedule (Hirvonen 2001; Reijnen et al. 1996; Slabbekoorn and Peet 2003; Wood and Yezerinac 2006). For some species, such as the least Bell's vireo, the intensity level of noise can mask territorial singing. Hein (1997) identified the 60-decibel (dB) noise threshold for impacts on the least Bell's vireo based on the theory of masking. At a distance of 328 feet, which is the diameter of a 1.98-acre territory, approximately 50% of the least Bell's vireo's song would be masked by a background noise level of 60 dBA equivalent. This level of masking was considered to have potential adverse effects on the behavioral activity, including reproduction, of the least Bell's vireo (Hein 1997).

5.2.2.5.2 HABITAT CHARACTERISTICS AND USE

As a nearly obligate riparian breeder, the least Bell's vireo occupies a more restricted nesting habitat than the other subspecies of Bell's vireo as summarized in the USFWS *Determination of Endangered Status for the Least Bell's Vireo* (51 FR 16474–16482). The least Bell's vireo primarily occupies riverine riparian habitats characterized by southern willow scrub, cottonwood forest, mulefat scrub, sycamore alluvial woodland, coast live oak riparian forest, arroyo willow riparian forest, wild blackberry, or mesquite in desert localities (USFWS 1998). It uses habitat that is limited to the immediate vicinity of watercourses below 1,500 feet amsl elevation in the interior (51 FR 16474–16482; Small 1994). In the coastal portions of Southern California, the least Bell's vireo occurs in willows and other low, dense valley foothill riparian habitat and lower portions of canyons and along the western edge of the deserts in desert riparian habitat (Zeiner et al. 1990b).

The least Bell's vireo tends to establish territories on sites with a particular early successional habitat configuration that typically feature dense cover within 3 to 6 feet of the ground and a dense, stratified canopy (USFWS 1998). Vireo nest sites are most frequently located in stands between 5 and 10 years of age (RECON 1989). With the available information, it is not possible to state conclusively whether the vireo prefers vegetation between 5 and 10 years of age or whether its selection merely reflects the availability of vegetation within a particular area (RECON 1989). However, riparian plant succession appears to be an important influence in maintaining vireo habitat (Franzreb 1989; Goldwasser 1981).

In addition, the width of the vegetation belt appears to be important for establishing vireo territories. Native upland buffers are particularly important in narrow drainages (Franzreb 1989). Those pairs that select areas bordered by coastal sage scrub and grasslands tend to be more successful at fledging young than those nesting in areas bordered by agricultural and urban areas (Franzreb 1989). Territories adjoining golf courses, campgrounds, and sand mines had significantly fewer successful pairs than those next to chaparral, coastal scrub oak, or grassland (Franzreb 1989).

During the spring and fall migration, the Bell's vireo occupies a wider range of habitats, including coastal sage scrub, riparian, and woodland habitats (Brown 1993). The portion of the winter range of Bell's vireo along the west coast of north and central Mexico includes thornscrub vegetation adjacent to watercourses or riparian gallery forests (Brown 1993). In southern Mexico and Honduras, tropical deciduous forest and arid tropical scrub along the coast is used (Brown 1993).

5.2.2.5.3 OCCURRENCE IN THE COVERED LANDS

Focused surveys were conducted in the TMV Planning Area from April to July 2007 for least Bell's vireo in accordance with established USFWS survey protocol, which requires eight surveys conducted between April 10 and July 31, with a minimum 10-day interval between surveys (Dudek 2009). No vireos were observed on the site during the 2007 focused surveys (Dudek 2009). A focused survey was also conducted for least Bell's vireo in the Beartrap Turnout Improvement Project study area in May to July 2011, with negative results (Dudek 2011a). The least Bell's vireo also was not detected in previous wildlife surveys covering the period of 1999 through 2004 (Impact Sciences, Inc. 2004) and 2005 (Jones and Stokes 2006a). Least Bell's vireos do not appear to use the site for breeding or foraging at this time. See *Appendix D.1* for more detailed information on survey methods.

Suitable habitat for least Bell's vireo was modeled on Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable nesting and foraging habitats on Covered Lands are riparian scrub, riparian woodland, oak riparian, riparian wetland, and desert wash/riparian seeps at elevations between 2,000 and 4,100 feet.

Modeled suitable habitat within Covered Lands for least Bell's vireo is shown in *Figure 5-10, Least Bell's Vireo Modeled Suitable Habitat*. A total of 614 acres of breeding/foraging habitat for least Bell's vireo was modeled for Covered Lands. The negative TMV Planning Area survey results, exclusion of Covered Lands by USFWS from least Bell's vireo critical habitat, and current distribution data for the breeding population in central and Southern California suggest that the potential for least Bell's vireo to nest or forage on Covered Lands is low. In addition, it is unlikely that all modeled suitable habitat would be saturated and some modeled suitable habitat may not contain the nesting microhabitat features required by this species.

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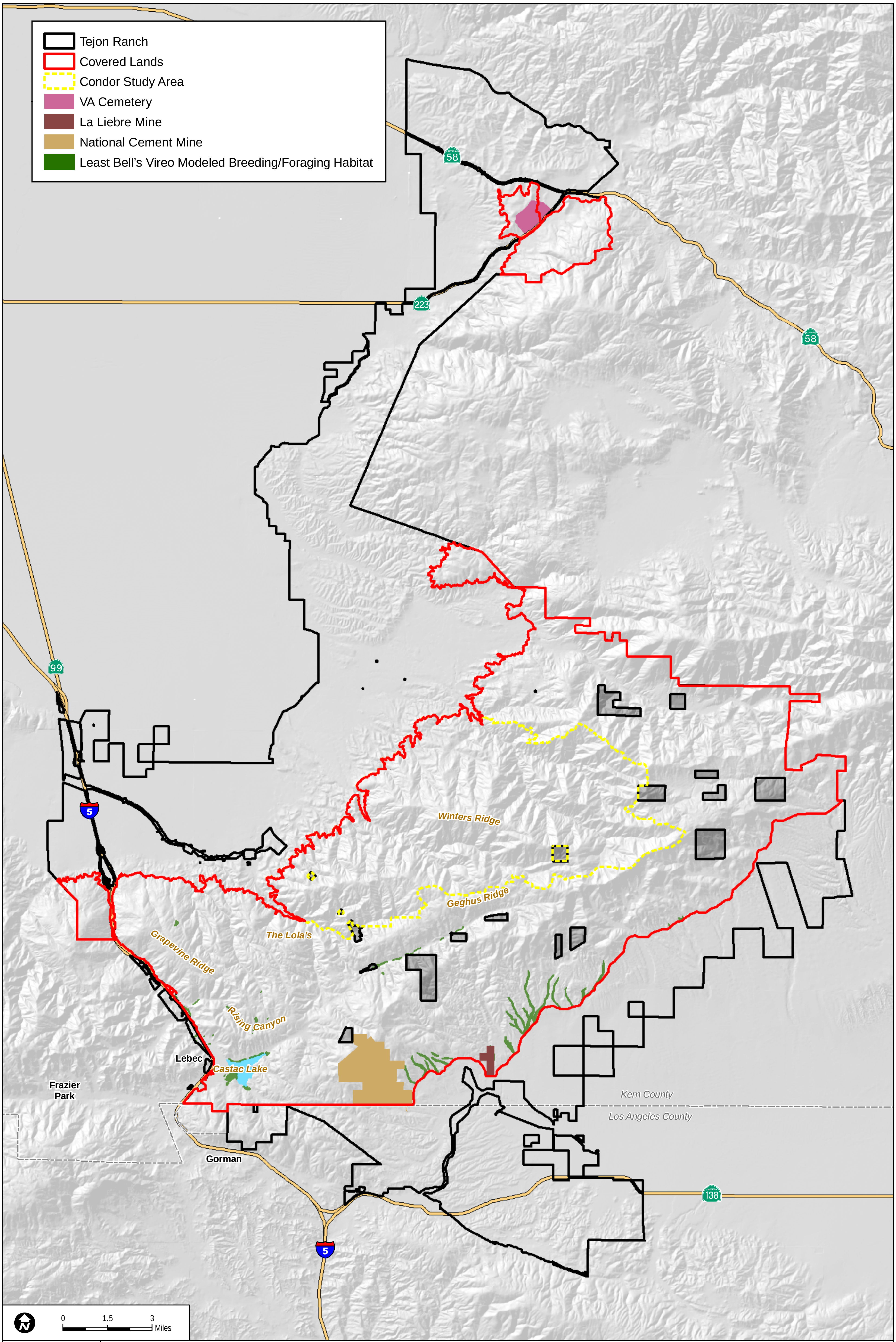

SOURCE: TRC 2007

FIGURE 5-10

Least Bell's Vireo Modeled Suitable Habitat

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5.2.2.6 LITTLE WILLOW FLYCATCHER

The willow flycatcher (*Empidonax traillii*)[10] is a small flycatcher (Godfrey 1986) that is a member of the avian family *Tyrannidae* and is one of 11 flycatchers in the genus *Empidonax* (USFWS 2002c). There are four subspecies of willow flycatcher (USFWS 2002c). The distinguishing features among the four subspecies are subtle and include differences in color, morphology, and habitat use (USFWS 2002c). The little willow flycatcher (*Empidonax traillii brewsteri*) is typically darker above than the other western subspecies of willow flycatcher (Sedgwick 2000). The breeding range of the willow flycatcher differs by subspecies (USFWS 2002c).

5.2.2.6.1 STATUS AND DISTRIBUTION

Regulatory History

The little willow flycatcher has no Federal designation; however, the full species of the willow flycatcher, including the little willow flycatcher, was listed as state endangered by CDFG in 1991 (CDFG 2000a). The little willow flycatcher is also protected under the Federal MBTA (16 U.S.C. 703–712).

Natural History

Willow flycatchers forage by either aerially gleaning (capturing an insect from a substrate while hovering) from trees, shrubs, and herbaceous vegetation, or hawking larger insects by waiting on exposed foraging perches and capturing insects in flight (Ettinger and King 1980; Sanders and Flett 1989). According to a study conducted on the diet of willow flycatchers by Craig and Williams (1998), the majority (over 95%) of the species' diet is comprised of insects, of which over 40% is in the family *Hymenoptera* (mostly wasps and bees).

Where they breed, little willow flycatchers arrive later in the breeding season compared to other passerines nesting in Sierran meadows. Males arrive in late May to early June, and females arrive about 1 week later. Breeding begins around mid-June (Craig and Williams 1998). Willow flycatchers have a short breeding season of three months or less (Sedgwick 2000). The earliest that willow flycatchers may be observed is approximately mid-May, when all of the subspecies may be present. However, the little willow flycatcher is one of the latest spring migrants in North America and may continue to move north until about June 20 (Craig and Williams 1998). Because the little willow flycatcher migrates through the breeding range of the southwestern willow flycatcher (*E. t. extimus*) and detection from field observations of subspecies morphology and call is not reliable, identification of the subspecies is dependent on the timing of the

[10] Willow flycatcher, which includes the subspecies little willow flycatcher, is referred to in this species account when documents cited include information on the species willow flycatcher but did not provide specific information on the subspecies little willow flycatcher.

observation (USFWS 2002c). Observation of a willow flycatcher in the breeding range of the southwestern willow flycatcher after June 22, especially if breeding activity is observed, is conclusive that the individual is the southwestern willow flycatcher since by this time, migrant little willow flycatchers have already passed through the region. Migrant willow flycatchers (full species) also may be observed in late July as they begin to pass through the region heading south to their wintering area (Sogge et al. 1997).

In the Sierra Nevada, little willow flycatchers returned to the same breeding territories between 25% and 31% of the time (Craig and Williams 1998). Egg-laying occurs relatively late in the season for the little willow flycatcher, with the first eggs being laid in the third week in June and the first fledglings appearing in mid-July (Sanders and Flett 1989). In 1997, of 25 nests monitored in the Tahoe, Toiyabe, and Plumas National Forests, the first nests fledged around July 21 to 22, and the last fledged around August 13 to 14 (Craig and Williams 1998).

Territory size for the little willow flycatcher varies from 0.22 to 0.94 acre (0.09 to 0.38 hectare) and averages 0.45 acre (0.18 hectare) in eastern Fresno County, California. On the Little Truckee River in Sierra County, 22 territories ranged from 0.15 to 2.2 acres (0.06 to 0.89 hectare) and averaged 0.84 acre (0.34 hectare) (Craig and Williams 1998; Sanders and Flett 1989). Little willow flycatchers may forage as far as 328 feet (100 meters) from their territories at this time (Sanders and Flett 1989). Fledglings of this subspecies may typically range into territories of adjacent pairs, often followed by parents, with little singing or chasing occurring, indicating a general decline of territory defense (Craig and Williams 1998).

Distribution and Population Trends

The little willow flycatcher breeds in California from Tulare County north along the western side of the Sierra Nevada and Cascades, extending to the coast in Northern California. It is a rare to locally uncommon summer resident from 1,969 to 8,005 feet amsl (600 to 2,440 meters amsl), and a common spring (mid-May to early June) and fall (mid-August to early September) migrant at lower elevations throughout the state, exclusive of the north coast (Zeiner et al. 1990b). Most of the remaining breeding populations occur in isolated mountain meadows of the Sierra Nevada and Cascades (Sanders and Flett 1989).

According to Craig and Williams (1998), the following represents the known breeding territories of the little willow flycatcher: (1) 23 to 36 territories in Sierra County (Perazzo Meadow/Little Truckee River/Lacey Valley area), which have been stable since 1982; (2) five territories observed in 1997 at Red Lake, in Alpine County; and (3) a possible breeding population along the Klamath River. In addition, 72 little willow flycatchers were noted in McCloud, Siskiyou County, in 1997, and 42 little willow flycatchers were observed in Warner Creek Valley, Plumas County, in 1997 (Craig and Williams 1998). None of these territories are in or near the Covered Lands (i.e., all outside of Kern County). Based on the current knowledge of the species, the entire breeding range of the little willow flycatcher is located outside of the Covered Lands.

The willow flycatcher winters in Mexico, Guatemala, Honduras, Nicaragua, Costa Rica, Colombia, and into South America (Sedgwick 2000).

Reasons for Decline

The decline of the willow flycatcher is attributed primarily to the loss and degradation of suitable breeding riparian habitat, due primarily to urbanization, over-grazing by livestock, and the conversion of riparian habitat to agricultural land. Much of the remaining habitat in California is at the geographic and elevation extremes reported for the species (Craig and Williams 1998). Brood parasitism by brown-headed cowbirds have also contributed to population reductions, although the little willow flycatcher appears to be affected less by cowbirds than other subspecies of willow flycatcher because the breeding season is later than that of the cowbird (Craig and Williams 1998).

Grazing of willows changes the foliage height and volume, and in southeast Oregon, willow flycatchers were much more abundant in infrequently grazed areas and undisturbed willows (Taylor 1986). In rivers that have dams, the alterations of water being released in the river may disrupt nesting cycles, and sometimes willow flycatchers may not attempt nesting if there is no flowing water (Johnson et al. 1999). The introduction of non-native species may also alter breeding attempts. Factors that threaten the southwestern willow flycatcher, another subspecies of willow flycatcher, are likely to affect the little willow flycatcher as well, given their similarity. Carothers and Brown (1991) found that in the Colorado River, introduction and spread of tamarisk (*Tamarix* spp.) may be partly responsible for the decline of the southwestern willow flycatcher due to the altered insect fauna and change in thermal protection from foliage; however, Durst et al. (2006) found more than 25% of southwestern willow flycatchers (total from Arizona, California, Colorado, New Mexico, Nevada, and Utah) nested in areas where tamarisk was dominant.

Habitat fragmentation is another threat to this species. The smallest documented breeding site for the little willow flycatcher was 0.62 acre (0.25 hectare) but the majority of breeding sites are 20 acres (8 hectares) in size or larger (Craig and Williams 1998).

Willow flycatchers in the Sierra Nevada (likely little willow flycatchers) have been observed nesting in shrubs near trails created for or used by cattle. This increases the risk that the nest will be knocked to the ground by cattle. Grazing also alters the density of riparian shrubs by removing the lower leaves and branches in which willow flycatchers usually nest. Brown-headed cowbirds also tend to be associated with cattle, and studies have correlated an increase in nest parasitism of willow flycatchers in areas with cattle grazing (Craig and Williams 1998).

5.2.2.6.2 HABITAT CHARACTERISTICS AND USE

The little willow flycatcher has been described by Craig and Williams (1998) as using several vegetation types in Washington and Oregon, including deciduous growth around the borders of clearings and brushy lowlands; shrubby portions of wooded stream bottoms; willow thickets bordering streamside lakes, woodland edges, young alder forests, and tall brush at the margins of fields; riparian hawthorn thickets; the shrub strata of floodplain forests; upland prairie remnants with hawthorn, rose, or *Prunus*; and ninebark thickets at the lower edge of conifer forests. Additional environmental features include openness of the shrub strata and proximity to water, although the immediate proximity of water is not an absolute requirement (Craig and Williams 1998).

In California, in contrast, habitat descriptions for little willow flycatchers in the central and southern Sierra Nevada emphasize riparian, willow-dominated vegetation (Grinnell and Miller 1944; Gaines 1988). Habitat use in these regions typically includes moist meadows with perennial streams and smaller spring-fed or boggy areas with willow or alder (*Alnus* spp.) (Craig and Williams 1998). Little willow flycatchers have also been found in other riparian environments of various types and sizes, ranging from small willow-surrounded lakes or ponds with a fringe of meadow or grassland, to various willow-lined streams, grasslands, or boggy areas (Craig and Williams 1998). Although non-shrub trees do not appear to be a required habitat component, little willow flycatchers will use scattered trees for singing and foraging perches, and females will use the foliage of trees as gleaning substrate during the nesting period (Sanders and Flett 1989). Habitat edge, in the form of openings within thickets of riparian deciduous shrubs, appears to be an important component of little willow flycatcher habitat (Sanders and Flett 1989).

Migrant willow flycatchers may occur in non-riparian habitats and/or be found in riparian habitat patches that are otherwise unsuitable for breeding. The range of habitats used during these migration stopovers is much wider than that preferred for breeding, and includes narrow, linear riparian strips less than 32.8 feet (10 meters) wide (Sogge et al. 1997). Such migration stopover areas for the little willow flycatcher species may be critically important resources affecting local and regional flycatcher productivity and survival (Sogge et al. 1997). While only a single study was found on the use of migratory stopover sites, it appears that willow flycatchers stay only briefly at stopover sites. On the Middle Rio Grande River in New Mexico, of 84 migrant willow flycatchers captured in 2 years, only seven were recaptured (Yong and Finch 1997). All the recaptures occurred within 1 day of the initial capture and the recaptured flycatchers had added on average 1.6% body mass per day. About 50% of the captures had no fat stores, suggesting that stopovers are brief but frequent (Yong and Finch 1997).

The willow flycatcher, in general, nests in willows, alders, and cottonwoods or other riparian deciduous vegetation (Craig and Williams 1998). The little willow flycatcher appears to prefer nesting near the edges of vegetation clumps and near streams (Sanders and Flett 1989). In meadows along the Little Truckee River, nests were built in shrub willows (*Salix lemmonii* and

S. jepsonii) (Sanders and Flett 1989). Nests in these meadows are generally located in riparian deciduous shrubs at least 6.6 feet (2 meters) high, with a foliar density of approximately 50% to 70%, and with about 3.3 feet (1 meter) of cover above the site (Sanders and Flett 1989). Nests are usually placed in a vertical fork of a riparian deciduous shrub and built around supporting twigs (Sedgwick 2000; Flett and Sanders 1987; Sanders and Flett 1989; Harris 1991).

5.2.2.6.3 OCCURRENCE IN THE COVERED LANDS

USFWS protocol surveys (Sogge et al. 1997; USFWS 2000) were conducted from May to July in 2007 in all suitable habitat, including breeding habitat, within the TMV Planning Area. In accordance with the protocol, one survey was conducted in each of the four survey areas during the period from May 15 to 31; one survey was conducted in each of the four survey areas between June 1 and 21; and three surveys were conducted in each of the four survey areas between June 22 and July 17 at a minimum of 5-day intervals. Foraging observations of willow flycatchers were made in willow-dominated riparian areas adjacent to Castac Lake, near Cuddy Creek, in Beartrap Canyon, in Rising Canyon, and along Grapevine Creek; and based on the timing of the observation, they were likely little willow flycatchers migrating to breeding territories to the north. The foraging observations were made during the first two protocol survey periods in 2007, but no willow flycatchers were observed during the third protocol survey period. A focused survey was also conducted for willow flycatchers in the Beartrap Turnout Improvement Project study area in May to July 2011 (Dudek 2011a). Two willow flycatchers were observed foraging and calling in May 2011 and one individual was observed on June 2, 2011. No willow flycatchers were observed during the second and third survey periods, and it was concluded that the observed flycatchers were migrant little willow flycatchers (Dudek 2011a). Willow flycatchers were also observed several times during protocol surveys in 2005 (Jones and Stokes 2006a). Because no willow flycatchers were found during follow-up visits, it was assumed that these birds were migrants as well. Impact Sciences, Inc. (2004) made similar observations during surveys conducted in 2003. Based on the results of the focused surveys, little willow flycatchers are not expected to nest on site. In addition, its breeding range is north of the Covered Lands (Craig and Williams 1998). However, there is high potential for little willow flycatcher to use suitable foraging habitat for stopover on Covered Lands. See *Appendix D.1* for more detailed information on survey methods.

Suitable habitat for little willow flycatcher was modeled for all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable foraging/winter stopover habitats on Covered Lands are riparian scrub, riparian woodland, oak riparian, riparian/wetland, and desert wash/riparian seeps.

Modeled suitable habitat within Covered Lands for little willow flycatcher is shown in *Figure 5-11, Little Willow Flycatcher Modeled Suitable Habitat*. A total of 986 acres of foraging/winter stopover habitat for little willow flycatcher was modeled for Covered Lands.

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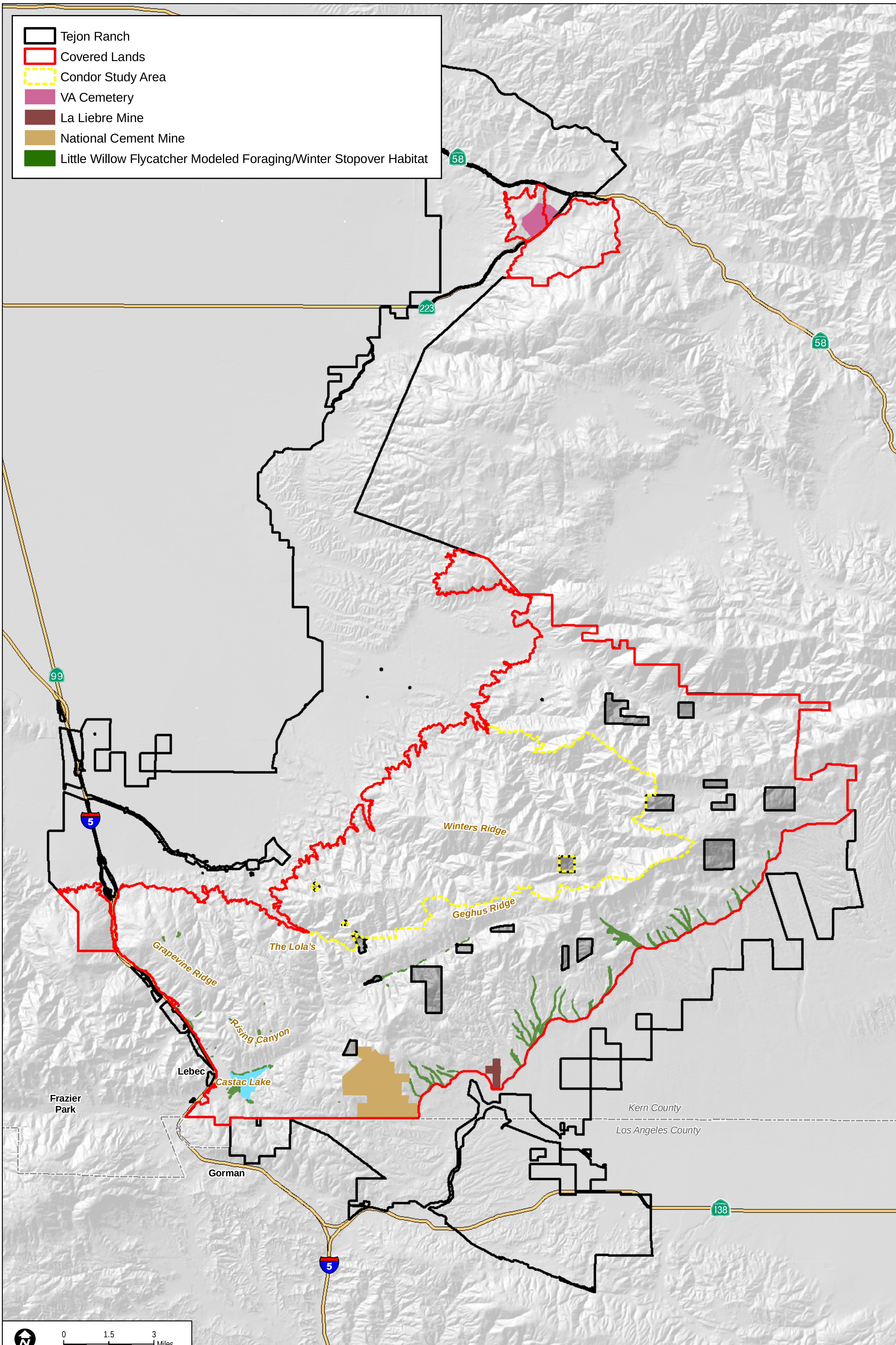

SOURCE: TRC 2007

FIGURE 5-11

Little Willow Flycatcher Modeled Suitable Habitat

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5.2.2.7 PURPLE MARTIN

Purple martins (*Progne subis*) are classified under the order *Passeriformes*, which includes the perching birds. Further classification places the purple martin in the swallows and martins family (*Hirundinidae*). All members of the genus *Progne*, of which the purple martin is a member, are closely related and similar in ecology and behavior. Higher-level systematics based on biochemical evidence indicate that *Progne* martins arose from the hole-excavating swallows, in contrast to early speculation that secondary-cavity nesters like *Progne* were the most primitive *hirundinid* genera (Sheldon and Winkler 1993).

Purple martins are the largest swallow in North America and average 7 inches in length (Gough et al. 1998). Adult males are dark purple and often appear black, while adult females are primarily dark gray with some purple coloration (Gough et al. 1998). In addition, females differ from males in that their breast is whitish with a gray band and they have occasional speckling on their sides and belly (Gough et al. 1998). Both males and females have forked tails (Gough et al. 1998). Juvenile male and female purple martins look similar to mature females; however, the males may be splotched with dark purple (Gough et al. 1998). Their size and color, along with their comparatively tiny bill, are often used to distinguish them from other swallows (Gough et al. 1998).

5.2.2.7.1 STATUS AND DISTRIBUTION

Regulatory History

The purple martin has no Federal designation but is a CDFG Species of Concern (CDFG 2011b). It is also protected under the Federal MBTA (16 U.S.C. 703–712).

Natural History

The diet of the purple martin is composed almost entirely of flying insects (Brown 1997). Types of insects taken vary across the season and probably depend on availability (Brown 1997). Individuals feed most often between 164 and 492 feet above ground (Brown 1997). Occasionally, the purple martin forages on the ground for ants and other insects (Bent 1942). Individuals will forage for insects above water surfaces in ponds and lakes if cold, rainy weather limits the availability of normal food sources (Brown 1997). Usually the purple martin feeds solitarily and does not attempt to feed when air temperature is below about 50°F (Brown 1997). The purple martin drinks while in flight only, by skimming the water surface (Ehrlich et al. 1988; Brown 1997). According to Brown (1997), purple martins may forage up to 30 miles from post-breeding and winter roost sites.

In the western United States, the purple martin nests in old woodpecker cavities, mostly in habitats with patches of tall sycamores, pines, and other large trees in or near oak woodlands or within open coniferous forests (Garrett and Dunn 1981). The nests may be located in tall, old, isolated trees or snags in open forest or woodland (Zeiner et al. 1990b; Dawson 1923). The western populations of the purple martin nest solitarily in natural or woodpecker-made cavities in trees or cacti (Stutchbury 1991). Cavity-containing trees that have been used as nest sites include pines, aspens, cacti, palms, oaks, sycamores, spruce, firs, and cypress. Because the purple martin uses cavities excavated by several different bird species, the cavities that are chosen for nesting differ greatly in size, depth, entrance-hole diameter, height above ground, and position within the tree or cactus. For one location in Arizona, the mean cavity height was 24 feet above ground (Brown 1997). In eastern North America, nesting may also occur, although less often, in human-made structures, nesting boxes, culverts, and under bridges. The use of birdhouses is restricted to the more eastern populations. Unlike tree swallows (*Tachycineta bicolor*), purple martins apparently have not adapted to artificial nest boxes within Southern California (Garrett and Dunn 1981). Thus, attempts to manage the species may be problematic.

The purple martin nests from April to August, with peak activity in June. Pairs nest colonially or singly, depending on nest site availability. Nest building usually does not begin until several weeks after a pair bond has formed (Brown 1997). Purple martins are usually monogamous (Brown 1997). A second clutch may be laid if the first nest fails (Brown 1997). Nest selection occurs by both sexes after a relatively long search (Brown 1997). Nests are built out of twigs and stems of herbaceous plants, leaves, and mud (Brown 1997). Individuals may reuse the same nest cavity in successive years (Brown 1997). The mean clutch size has been measured at between 4.0 and 4.9 eggs per nest (Brown 1997). The typical range for the clutch size is three to six (Brown 1997). In some years, the purple martin may raise two broods. The young are tended by both parents, and leave the nest at 24 to 31 days (Harrison 1978). Yearlings can breed but have a reduced success rate and are often found defending cavities with no nests (Brown 1997).

The maximum lifespan recorded for the purple martin is 13 years and 9 months in Texas (Brown 1997). Based on band recovery, annual survival rates have been measured at 60.9% for adults and 32.2% for yearlings (Brown 1997). Purple martins suffer from viral avian pox and various body parasites, which may or may not affect reproduction or survivability (Brown 1997; Wagner et al. 1997). Adverse weather kills more purple martins than all other sources of mortality combined (Brown 1997).

The purple martin is a north–south migrant, following the Central American isthmus between North and South America (Brown 1997). Immediately following fledging, individuals begin to flock before the fall departure (Brown 1997). The young of the year wander great distances and relatively few return to the specific natal colony site. However, among banded birds encountered in their first breeding season, 61% were found within 1 mile of their natal nest. Some adults return to the previous year’s nest site (Brown 1997).

Both male and female purple martins will defend a nest site averaging 66 to 98 feet in radius around the nest (Brown 1997). In Montana, the nest-hole entrance was defended by the pair, and the male defended the female while she was foraging away from the nest (Allen and Nice 1952). Nesting colony size is limited by the number of potential nests; the median nearest-neighbor distances in Arizona were between 771 and 1,066 feet. The purple martin is highly social during the non-breeding season, concentrating in enormous pre-migratory roosts. In some cases, the gregarious nature of communal roosts continues into the nesting season; however, the individuals within the communal roost appear to be non-breeding individuals. During winter roosting, individuals are spaced only 2 to 2.5 inches apart (Brown 1997).

Owls and snakes are probably the most significant predators of both adults and nestlings of this species (Brown 1997). European starlings (*Sturnus vulgaris*) and house sparrows (*Passer domesticus*) compete with martins for nest cavities (Brown 1997). Occasionally, native species will nest in purple martin houses (Brown 1997).

Distribution and Population Trends

Purple martins breed locally from British Columbia disjunctly eastward to Nova Scotia, southward to Baja California, central Mexico, and the Gulf Coast. Although the species' winter range is not well known, the species primarily winters (presumably) in Amazonia and south–central Brazil. In any case, there are no documented winter records of purple martins for anywhere in North or Central America (AOU 1998). Weather-related mortality periodically eliminates birds along the northern edge of the species range, but these areas are usually reoccupied by at least a few individuals within several years. The overall northern limit of the breeding range in Canada has probably shifted southward in the recent century. Installation of birdhouses in the middle and western Great Plains may have permitted a range expansion in recent years. A population estimate published in 2005 for purple martin breeding pairs in the Pacific states and British Columbia was about 3,500 pairs, but no trend was stated (Airola and Williams 2008).

In California, the purple martin is an uncommon to rare local summer resident in a variety of wooded habitats throughout the state Zeiner et al. (1990b). It is a rare migrant in spring and fall and is absent in the winter. In the south, it is now only a rare and local breeder on the coast and in interior mountain ranges, with few breeding localities (Garrett and Dunn 1981). The purple martin is absent from the higher desert regions except as a rare migrant. It is also absent from the Central Valley with the exception of several urban localities where the species nests in seep holes under freeway overpasses in the Sacramento area (Airola and Grantham 2005). In the north, it is an uncommon to rare local breeder on the coast and inland (McCaskie et al. 1979). It is absent from the higher slopes of the Sierra Nevada. The breeding range extends east to Modoc and Lassen Counties (Airola 1980). It arrives from South America in late March. The numbers during migration and through the summer remain small. After the young of the year have fledged, flocking begins. Birds of all ages assemble in roosts before the fall departure. Birds in the late-summer roosts generally disperse from the roost site before dawn to forage (Brown 1997). The purple martin departs by late September (Zeiner et al. 1990b).

The current estimated population in California is 900 to 1,350 pairs (Airola and Williams 2008). The Tehachapi Mountains support 100 to 200 pairs and may be the one remaining area in California where purple martins regularly nest in oak woodland (Airola and Williams 2008). In 1982, the southern Tejon Ranch/Grapevine area supported between approximately 40 and 100 pairs of purple martins (Airola and Williams 2008).

Reasons for Decline

The purple martin was considered a fairly common summer resident in the early 1930s and had even spread by that time into cities (Willett 1933; Garrett and Dunn 1981). Numbers of the purple martin have declined markedly in recent decades, however, because of the loss of riparian habitat, removal of snags, and competition for nest cavities (Remsen 1978). Loss of mid-elevation habitat and European starling competition in lowland woodlands are the two main reasons for decline of purple martins in California (Airola and Williams 2008). Loss of mid-elevation forest habitat has occurred due to removal of large snags, post-fire salvage logging, shortened logging rotations, and associated lack of large trees (Airola and Williams 2008). Nest competition from starlings in lowland woodland that began in the 1960s has significantly reduced the chance of recolonization of most lowland woodland areas (Airola and Williams 2008). Use of some bridges as nest sites has been affected by changes in land uses under the bridges (e.g., parking facilities and storage sites) that reduce airspace, and construction and landscaping activities have precluded martins from using other nesting sites (Airola and Williams 2008). Other known or suspected threats include collisions with vehicles and trains and predation by feral cats (Airola and Williams 2008).

5.2.2.7.2 HABITAT CHARACTERISTICS AND USE

Purple martins may be found flying over virtually anywhere during migration, including grassland, wet meadow, and fresh emergent wetland, and are usually near water (AOU 1998). The birds typically breed in tall sycamores, pines, and other large trees in or near oak woodlands or open coniferous forest (Garrett and Dunn 1981). The species frequents old-growth, multi-layered open forest and woodland with snags in the breeding season. It forages over riparian areas, forest, and woodland. The species is an uncommon to rare local summer resident in a variety of wooded habitats throughout the state. The species uses valley foothill and montane hardwood, valley foothill and montane hardwood-conifer, and riparian habitats. It also occurs in coniferous habitats, including closed-cone pine-cypress, ponderosa pine, Douglas-fir, and redwood (*Sequoia sempervirens*). It typically breeds in tall sycamores, conifers (such as closed-cone pine or cypress), ponderosa pine [*Pinus ponderosa*], Douglas-fir, and redwood and other large trees in or near oak woodlands or open coniferous forest. Suitable breeding habitat is characterized by old-growth, multi-layered open forest and woodland with snags (Garrett and Dunn 1981). It nests in cavities constructed by other bird species in tall, old trees near a body of water and it also nests occasionally in residential areas. The pre-migratory roost sites are generally situated in stands of trees or underneath concrete bridges (Brown 1997). The purple martin is found in a variety of open habitats in migration (Zeiner et al. 1990b).

In western North America, the more northerly populations occur in the Upper Sonoran (mid-elevation chaparral community, including chamise, scrub oak, and California buckwheat) through the transition (higher elevations supporting pines, firs and cedars) zones. It does not widely use birdhouses in the western portions of the United States but is restricted to areas with dead snags containing woodpecker holes, which are generally patchy and local in occurrence. The birds' apparent absence from many potentially suitable areas in the Northern Rockies, the intermountain region, California, the Pacific Northwest, and the Mexican Highlands may mean that the species has more specific habitat requirements in these areas that are unknown (Brown 1997).

5.2.2.7.3 OCCURRENCE IN THE COVERED LANDS

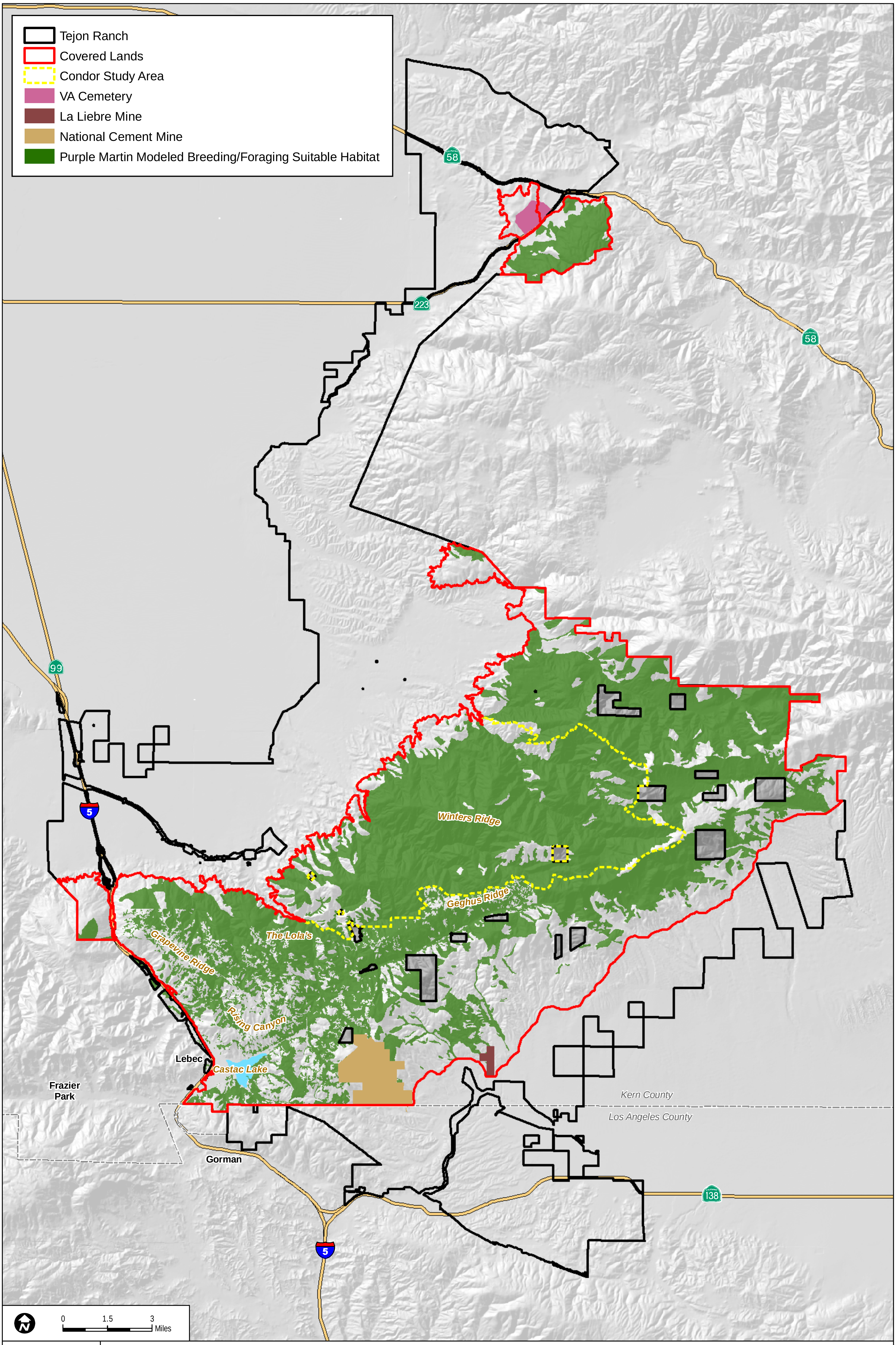
Surveys for purple martin were conducted in the TMV Planning Area in conjunction with several special-status bird surveys, including raptors and riparian species. There is no established protocol survey methodology specifically for purple martin, but they use the same woodland and forest habitats used for nesting by several raptors and breed at similar times as the northern goshawk (*Accipiter gentilis*) (i.e., early spring). Additionally, purple martin also uses riparian habitat used by Federally and/or state-listed riparian birds (least Bell's vireo, willow flycatcher, and western yellow-billed cuckoo [*Coccyzus americanus occidentalis*]). Surveys for nesting special-status raptors were conducted in the TMV Planning Area by Dudek in spring and summer of 2007, and winter-use surveys were conducted in November of 2006 (Dudek 2009). The spring and summer surveys for special-status raptors used the methods described by Fuller and Mosher (1987) (Dudek 2009). The first set of nesting surveys was conducted early in the nesting period between March 6 and March 30, 2007. The second set of nesting surveys, including approximately 18 road and walking surveys, was conducted between June 4 and July 6, 2007. A winter special-status bird survey was also conducted between November 14 and November 16, 2006 (Dudek 2009). In addition, Dudek biologists conducted dawn acoustic surveys for the northern goshawk from March through April 2007 in accordance with the USFS (2000) survey protocol, and surveys for Federally and/or state-listed riparian birds were also conducted (Dudek 2009). See *Appendix D.1* for more detailed information on survey methods.

Purple martin was observed nesting and foraging in the TMV Planning Area in 2005 and 2007. In 2005, Jones and Stokes observed six purple martin breeding locations, which consisted of individual nests or multiple nests within the same or adjacent trees (Jones and Stokes 2006a). In 2007, Dudek also observed six active breeding locations within crevices or holes in standing trees; at least two were in similar locations to those observed in 2005 and the others were in different locations. The 2005 and 2007 nesting locations are concentrated in the northwest portion of the TMV Planning Area east and west of Monroe Canyon, with other scattered sites east of Silver Canyon, east of Squirrel Canyon, east of Rising Canyon/Stockholders Canyon, and west of Geghus Ridge (Dudek 2009). In 2010, members of the Tejon Ranch Conservancy, Audubon California, and Western Field Ornithologists conducted surveys within the Covered Lands at several locations, including Tunis, Winters, Middle, and Cordon Ridges. At least 23 pairs of purple martins were detected during this survey, all in large valley oak trees (Western Field Ornithologists 2011).

Based on survey results, the purple martin appears to be relatively widespread in the oak woodland and oak savannah communities in the Covered Lands. Old mature trees with cavities or broken tops are generally required for use by purple martins, so the species' distribution within these communities may be restricted by the extent of mature or decadent oak trees, particularly valley oak trees, on the Covered Lands. All reported detections of purple martins on the Covered Lands have been in valley oak trees in oak savannah or woodland habitat.

Suitable habitat for purple martin was modeled on all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable breeding/foraging habitats on Covered Lands are savannah, woodland, conifer, and riparian woodland.

Modeled suitable habitat within Covered Lands for purple martin is shown in *Figure 5-12, Purple Martin Modeled Suitable Habitat*. A total of 85,870 acres of breeding/foraging habitat for purple martin was modeled for Covered Lands. However, because it is unlikely that all modeled suitable habitat would be saturated and because some modeled suitable habitat may not contain the microhabitat nesting criteria required by this species, not all modeled suitable habitat is expected to be occupied by purple martin. Based on the fact that the breeding locations from the 2005 and 2007 surveys are mostly non-overlapping, it was estimated that up to 10 purple martin breeding pairs may occur in the TMV Planning Area, with a range of 1,685 to 3,370 acres per active territory/breeding pair. Assuming a similar density and distribution of active territories/breeding pairs on the 85,870 acres of modeled breeding/foraging habitat on Covered Lands, the Covered Lands could support 25 to 50 breeding pairs. This estimate is consistent with a recent estimate of 100 to 200 pairs in the Tehachapi Mountains (Airola and Williams 2008). In 1982, the southern Tejon Ranch/Grapevine area supported between approximately 40 and 100 pairs of purple martins (Airola and Williams 2008).



SOURCE: TRC 2007

FIGURE 5-12

Purple Martin Modeled Suitable Habitat

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5.2.2.8 SOUTHWESTERN WILLOW FLYCATCHER

The willow flycatcher (*Empidonax traillii*)[11] is a small flycatcher (Godfrey 1986) that is a member of the avian family *Tyrannidae* and is one of 11 flycatchers in the genus *Empidonax* (USFWS 2002c). There are four subspecies of willow flycatcher (USFWS 2002c). The distinguishing features among the four subspecies are subtle and include differences in color, morphology, and habitat use (USFWS 2002c). The southwestern willow flycatcher is typically paler than other willow flycatchers and morphological differences between subspecies cannot be relied upon during field identification (USFWS 2002c). The breeding range of the willow flycatcher differs by subspecies (USFWS 2002c).

5.2.2.8.1 STATUS AND DISTRIBUTION

Regulatory History

The southwestern willow flycatcher was designated as an endangered species by USFWS in 1995 (60 FR 10694–10715). The full species of willow flycatcher, including the southwestern willow flycatcher, was listed as state-endangered by CDFG in 1991 (CDFG 2000a). In 2005, USFWS designated portions of 100-year floodplains in Southern California, southern Nevada, southwestern Utah, south–central Colorado, New Mexico, and Arizona as critical habitat for the southwestern willow flycatcher, and included portions of Kern, Santa Barbara, San Bernardino, and San Diego Counties in Southern California (70 FR 39227–39231). No critical habitat has been designated for this species in the Covered Lands. The southwestern willow flycatcher is also protected under the Federal MBTA (16 U.S.C. 703–712).

Natural History

Willow flycatchers forage by either aerially gleaning (capturing an insect from a substrate while hovering) from trees, shrubs, and herbaceous vegetation, or hawking larger insects by waiting on exposed foraging perches and capturing insects in flight (Ettinger and King 1980; Sanders and Flett 1989). According to a study conducted on the diet of willow flycatchers by Craig and Williams (1998), the majority (over 95%) of the species' diet is insects, of which over 40% is in the family *Hymenoptera* (mostly wasps and bees).

Typically, southwestern willow flycatchers arrive on their breeding grounds between early May and early June and remain there for approximately 3 to 4 months (USFWS 2002c). Nest building usually begins within a week of pair formation, and egg-laying can begin as early as late May, but more often begins mid-June. Chicks are present in nests from mid-June through early August (Sogge et al.

[11] Willow flycatcher, which includes the subspecies southwestern willow flycatcher, is referred to in this species account when documents cited include information on the species willow flycatcher but did not provide specific information on the subspecies southwestern willow flycatcher.

1997). In general, southwestern willow flycatchers that breed at higher elevations or in more northerly areas begin breeding several weeks later than those breeding in the lower elevations or southern areas of the United States (USFWS 2002c). Vocalizations are a major component of southwestern willow flycatcher breeding behavior, including the establishment of territories, courtship, and communication with conspecific and interspecific individuals (Krebs 1977).

Southwestern willow flycatcher fledglings begin to leave the nest in early July (58 FR 39495–39519) and disperse from the natal territory in mid- to late July. About 25% of adults return to their territory from the previous year; at least 20% of juveniles return to the natal area, which is usually 1.2 to 2.5 miles (2 to 4 kilometers) from the natal territory. Adults usually depart from their breeding territory between August 12 and September 4 (San Diego Natural History Museum 1995). Dispersal distances 14 to 15 days following fledging are not well known (USFWS 2002c).

Territory size of the southwestern willow flycatcher varies from 0.3 to 5.0 acres along the Kern River, the closest known population to the Covered Lands, and may be very contracted during the incubation and nesting phase of breeding (Finch and Stoleson 2000). According to USFWS (2002c), estimated breeding territory sizes for southwestern willow flycatcher generally range from 0.25 to 5.7 acres, with most territories ranging from 0.5 to 1.2 acres. Some southwestern willow flycatcher territories are bordered by additional riparian habitat that is not defended as a breeding territory, but may be important in attracting flycatchers to a particular site or in providing an environmental buffer. It may also serve as habitat to be used by juveniles or adults during post-nesting periods and as dispersal areas (USFWS 2002c). Flycatchers often cluster their territories into small portions within a riparian site and major portions of the site may be occupied irregularly or not at all (USFWS 2002c). Consequently, Sogge et al. (1997) concluded that it cannot be assumed that a habitat is unsuitable or unoccupied in the long term based on flycatchers' absence during only a single year, especially if there is evidence of recent use.

Little is known about movements of the southwestern willow flycatcher between breeding sites or about site-fidelity of the species. Some large populations have persisted for 10 or more years (Sedgwick 2000). Other, smaller populations may be more ephemeral and last only a few years. Breeding populations may also reappear at unoccupied sites following 1- to 5-year absences (Sedgwick 2000). Migrant southwestern willow flycatchers may occur in upland communities or lower-quality riparian habitats, but their migratory stopover areas, which are not well understood or documented, may be important resources affecting the survival of the species (USFWS 2002c).

Distribution and Population Trends

The southwestern willow flycatcher has a breeding distribution in seven states: Arizona, New Mexico, California from the Santa Ynez River south, southwestern Colorado, extreme southern portions of Nevada and Utah, and western Texas (USFWS 2002c). Specifically, the breeding distribution of the southwestern willow flycatcher in California extends from the Mexican border north to Independence in the Owens Valley, the South Fork Kern River, and the Santa Ynez River in Santa Barbara County (Craig and Williams 1998). Additionally, this taxon overwinters in Mexico (USFWS 1995). Important stopovers along the Rio Grande provide important refueling sites for flycatchers as they migrate between their breeding and wintering grounds (Yong and Finch 1997).

The migration routes and overwintering destinations of the southwestern willow flycatcher are not well understood (USFWS 2002c). The southwestern willow flycatcher most likely winters in Mexico, Central America, and northern South America (USFWS 2002c). Wintering habitats are generally humid to semi-arid, partially open areas that are typically near a wetland (USFWS 2002c). Examples of habitats include woodland borders, second growth forest, savannah edges, fields and pastures, and patches of dense woody shrubs (USFWS 2002c).

Once considered a widespread and common breeder in Southern California, the southwestern willow flycatcher has declined precipitously throughout its range during the last 50 years (Unitt 1987). Southwestern willow flycatcher–occupied riparian habitats tend to be widely separated by vast expanses of relatively arid and unsuitable lands (Unitt 1987). However, according to Durst et al. (2008), survey efforts throughout the subspecies' range in Arizona, California, Colorado, New Mexico, Nevada, and Utah have documented new breeding sites and territories since the early 1990s. In 1993, there were approximately 140 documented territories distributed among 41 documented breeding sites. By 2007, based on the most recent rangewide estimate for breeding sites and territories, there were approximately 1,299 documented territories distributed among 288 documented breeding sites. However, of the 288 documented breeding sites, nesting territories had disappeared from 142 of the sites—all but two of which had five or fewer territories (the other two larger sites that disappeared were destroyed by inundation and wildfire). The 142 documented sites account for only a small percentage of documented territories because they had small populations and their loss did not greatly affect the overall rangewide territory estimates (Durst et al. 2008). As of 2007, 96 breeding sites supporting approximately 172 territories have been documented in California, accounting for about 33% of all documented breeding sites in the subspecies' range and 13% of all documented nesting territories (Durst et al. 2008). Arizona and New Mexico currently account for the majority of the documented breeding sites (57%) and documented territories (75%) (Durst et al. 2008).

Reasons for Decline

The primary cause of the decline of the southwestern willow flycatcher is loss and modification of habitat (USFWS 2002c). The loss, fragmentation, and degradation of suitable riparian habitat is due primarily to urbanization, recreation, and water diversion; impoundments, channelization, and replacement of native habitat by introduced plant species; over-grazing by livestock; and the conversion of riparian habitat to agricultural land (Sedgwick 2000). Most of the major, and many of the minor, southwestern streams that likely supported southwestern willow flycatcher habitat are now dammed (USFWS 2002c). The operation of dams modifies, reduces, destroys, and sometimes increases riparian habitat both downstream and upstream of the dam site. Surface water diversions and groundwater pumping for agricultural, industrial, and municipal uses are major factors in the deterioration of suitable southwestern willow flycatcher habitat. Riparian ecosystems have also been modified through physical manipulation of stream courses by such means as channelization, bank stabilization, levees, and other forms of flow controls, chiefly for flood control. In some areas, riparian vegetation is removed from streams, canals, and irrigation ditches to increase watershed yield, remove impediments to stream flow, and limit water loss through evapotranspiration (USFWS 2002c). Recreational uses can reduce suitable habitat by trampling, clearing, woodcutting, and prevention of seedling germination due to soil compaction, bank erosion, and increased incidence of fire. Agricultural development can entail not only direct clearing of riparian vegetation, but also modification of floodplains, diverting water for irrigation, groundwater pumping, and applications of herbicides and pesticides. Urban development results in many impacts to riparian ecosystems and southwestern willow flycatcher habitat. Urbanization within or adjacent to flycatcher habitat may provide for a variety of related direct and indirect effects (USFWS 2002c).

Grazing of willows by domestic livestock changes the willow foliage height and volume, and in southeast Oregon, willow flycatchers were much more abundant in infrequently grazed areas and undisturbed willows (Taylor and Littlefield 1986). In rivers that have dams, the alteration of water volume being released into the river may disrupt nesting cycles; sometimes, willow flycatchers will not attempt nesting if there is no flowing water (Johnson et al. 1999).

Brood parasitism by brown-headed cowbirds has also contributed to population reductions (Sogge et al. 1997). Although some host bird species seem capable of simultaneously raising both cowbirds and their own chicks, this is not true for the southwestern willow flycatcher (Sogge et al. 1997). Brown-headed cowbirds tend to be associated with cattle and studies have correlated an increase in nest parasitism of willow flycatchers in areas with cattle grazing (Craig and Williams 1998).

The introduction of non-native species may also alter breeding attempts. Sedgwick (2000) reported that in the Colorado River, introduction and spread of tamarisk may be partly responsible for the decline of the southwestern willow flycatcher due to the altered insect fauna and change in thermal protection from foliage; however, Durst et al. (2006) found that more than 25% of southwestern willow flycatchers (total from Arizona, California, Colorado, New Mexico, Nevada, and Utah) nested in areas where tamarisk were dominant. Non-native predator species, such as house cats, and natural predators, such as grackles and ravens, all of which are generally associated with urbanized areas, may predate active nests of the southwestern willow flycatcher (Sogge et al. 1997).

Insufficient migratory stopover habitat and destruction or degradation of existing habitat could lead to increased mortality during migration and/or prolonged migration resulting in late arrival to wintering or breeding sites. Migration is a period of high energy demands, and migrating individuals must find suitable stopover habitat at which to replenish energy reserves needed for the next step of their migration flight (Finch and Stoleson 2000).

The Recovery Plan for the southwestern willow flycatcher identifies a number of actions that could aid in the recovery of the species (USFWS 2002c). These actions include increasing and improving breeding habitat by restoring, mimicking, and/or recreating natural physical and biotic processes that influence riparian ecosystems, and reducing other stresses on the flycatcher. Specific actions include changing the management of surface and groundwater, including fundamental changes in dam operations; restoring flood cycles; reducing impacts of domestic livestock and native ungulates; improving metapopulation stability; securing long-term protection of breeding habitat; managing exotic plant species; reducing brood parasitism by brown-headed cowbirds; and conducting research to refine management practices and knowledge of the ecology of the species (USFWS 2002c).

5.2.2.8.2 HABITAT CHARACTERISTICS AND USE

During the breeding season, the southwestern willow flycatcher is restricted to riparian woodlands along streams and rivers with mature, dense stands of willows or cottonwoods (*Populus* spp.), or smaller spring-fed or boggy areas with willows or alders (Sedgwick and Knopf 1992). This species breeds in relatively dense riparian habitats in all or parts of seven southwestern states. Riparian vegetation provides both breeding and foraging habitat for the species.

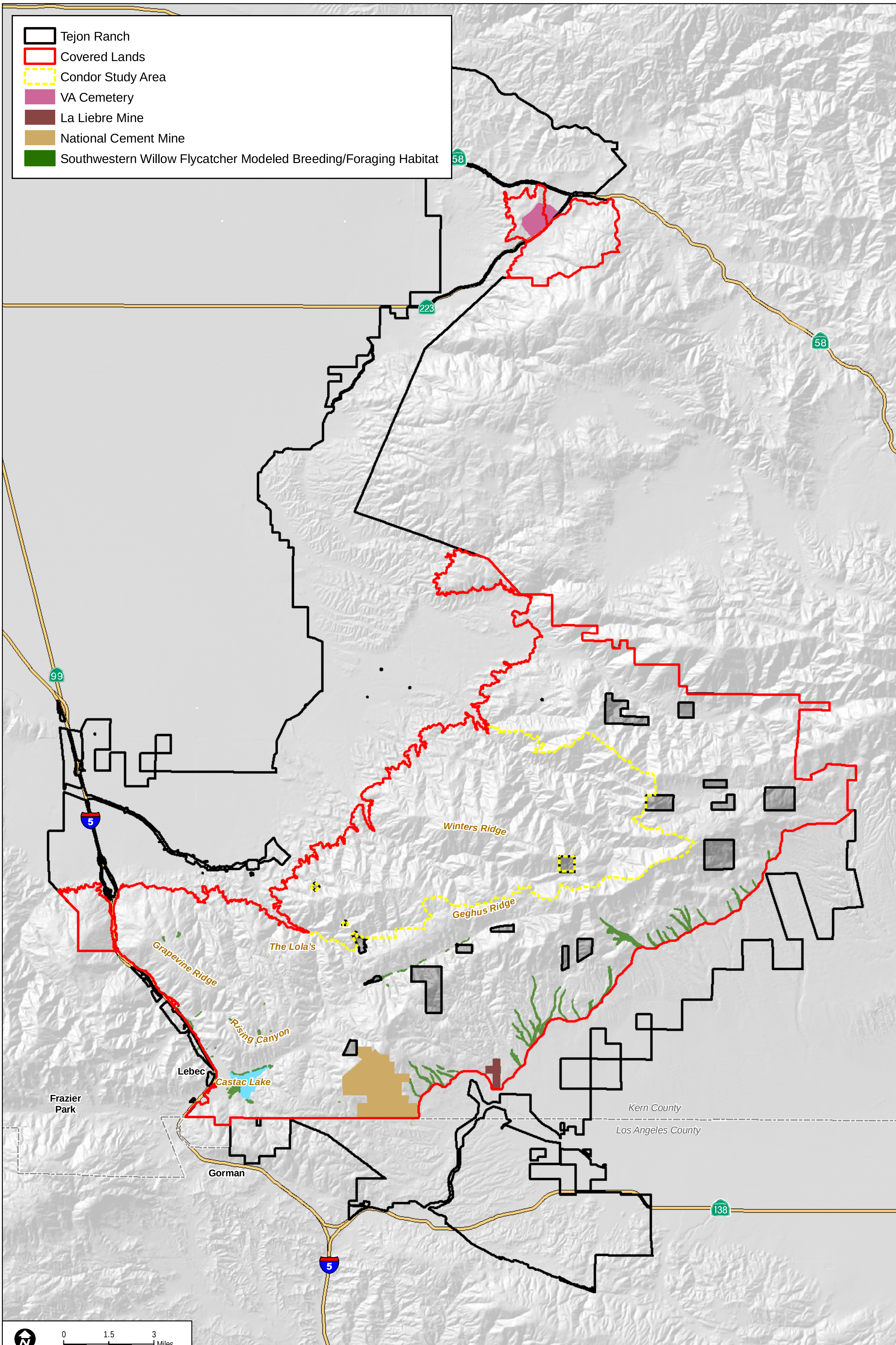
The vegetation at nest sites for southwestern willow flycatcher is typically even-aged, structurally homogeneous, and dense (Brown 1988; Whitfield 1990; Sedgwick and Knopf 1992). Southwestern willow flycatchers usually nest approximately 6.5 to 23 feet above ground in the upright fork of a tree or shrub (USFWS 2002c) but occasionally nest on horizontal limbs within trees and shrubs (Terres 1980). Historically, the willow flycatcher has nested primarily in willows and mulefat with a scattered overstory of cottonwoods (Grinnell and Miller 1944). Given changes in riparian plant communities, the willow flycatcher will nest in willows where available, but in New Mexico and Arizona the willow flycatcher has been known to nest in thickets dominated by tamarisk and Russian olive (*Elaeagnus angustifolia*) (Brown 1988; USFWS 2002c). Habitats that are not selected for either nesting or singing by southwestern willow flycatcher include riparian zones characterized by greater distances between willow patches and individual willows (Sedgwick and Knopf 1992). Nesting southwestern willow flycatchers invariably prefer areas with surface water nearby (Phillips et al. 1966). Suitable southwestern willow flycatcher habitat is less likely to occur in areas that cannot support dense riparian vegetation, such as steep, confined streams found in narrow canyons (USFWS 2002c). Suitable flycatcher habitat is more likely to develop in more extensive patches along lower gradient streams (USFWS 2002c).

5.2.2.8.3 OCCURRENCE IN THE COVERED LANDS

USFWS protocol surveys (Sogge et al. 1997; USFWS 2000) were conducted in 2007 in all suitable habitat, including breeding habitat, within the TMV Planning Area. In accordance with the protocol for southwestern willow flycatcher, one survey was conducted in each of the four survey areas during the period from May 15 to 31; one survey was conducted in each of the four survey areas between June 1 and 21; and three surveys were conducted in each of the four survey areas between June 22 and July 17 at a minimum of 5-day intervals. Several foraging willow flycatchers were observed during the first two protocol survey periods in 2007, but foraging willow flycatchers were absent during the third protocol survey period. These foraging observations were in willow-dominated riparian areas adjacent to Castac Lake, near Cuddy Creek, in Beartrap Canyon, in Rising Canyon, and along Grapevine Creek (Dudek 2007b). Because these willow flycatchers were observed only during the first two surveys and not during the third survey, it was concluded that they were most likely migrant little willow flycatcher subspecies, and not the southwestern willow flycatcher subspecies. A focused survey was also conducted for willow flycatcher in the Beartrap Turnout Improvement Project study area in May to July 2011 (Dudek 2011a). Two willow flycatchers were observed foraging and calling in May 2011 and one individual was observed on June 2, 2011. No willow flycatchers were observed during the second and third survey periods, and it was concluded that the observed flycatchers were migrant little willow flycatchers and not southwestern willow flycatchers (Dudek 2011a). Willow flycatchers were also observed several times during protocol surveys in 2005 (Jones and Stokes 2006a). Because no willow flycatchers were found during follow-up visits, it was assumed that these birds were also migrants. Impact Sciences, Inc. (2004) made similar observations during surveys conducted in 2003. To date, no southwestern willow flycatchers have been observed nesting in the TMV Planning Area. There are no CNDDB occurrences for the species on Covered Lands (CDFG 2011a). See *Appendix D.1* for more detailed information on survey methods.

Suitable habitat for southwestern willow flycatcher was modeled for all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable breeding/foraging habitats on Covered Lands are riparian scrub, riparian woodland, oak riparian, riparian/wetland, and desert wash/riparian seeps. Potentially suitable habitat exists in willow-dominated riparian areas adjacent to Castac Lake, near Cuddy and Grapevine Creeks, and in Beartrap and Rising Canyons.

Modeled suitable habitat within Covered Lands for southwestern willow flycatcher is shown in *Figure 5-13, Southwestern Willow Flycatcher Modeled Suitable Habitat*. A total of 986 acres of breeding/foraging habitat for southwestern willow flycatcher was modeled for Covered Lands. Negative survey results in the TMV Planning Area and current data suggest that the potential for southwestern willow flycatcher to nest or forage on Covered Lands is low. In addition, because it is unlikely that all modeled suitable habitat would be saturated and because it is assumed that some modeled suitable habitat may not contain the microhabitat nesting criteria required by this species, not all modeled suitable habitat is expected to be occupied by this species.



SOURCE: TRC 2007

FIGURE 5-13

Southwestern Willow Flycatcher Modeled Suitable Habitat

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5.2.2.9 TRICOLORED BLACKBIRD

The tricolored blackbird (*Agelaius tricolor*) belongs within the perching birds order (*Passeriformes*) and the family of buntings and finches (*Fringillidae*). Red-winged (*A. phoeniceus*) and tricolored blackbirds are two closely related species in a genus that also includes the tawny-shouldered blackbird (*A. humeralis*) and the yellow-shouldered blackbird *(A. xanthomus*) found in the Caribbean.

The tricolored blackbird is a medium-sized bird whose physical characteristics vary between male and female. Adult male birds are entirely black with a red and white patch on the wing shoulder. Adult females are mostly black with gray streaks throughout their body. Females also have a small red patch on the shoulder, but it is much less distinct than that of an adult male. In addition, female tricolored blackbirds have a white chin and throat. Juveniles of both sexes are similar to adult females but are a paler gray, and the juvenile female lacks the red shoulder patch (Beedy and Hamilton 1999).

5.2.2.9.1 STATUS AND DISTRIBUTION

Regulatory History

The tricolored blackbird is a California Species of Special Concern (CDFG 2011b). It was petitioned for Federal listing in 2004, but USFWS made a decision in December 2006 that the species did not warrant protection (71 FR 70483–70492). It is also protected under the Federal MBTA (16 U.S.C. 703–712).

Natural History

This species feeds primarily on seeds and invertebrates, and requires an abundant, concentrated supply of insects for successful breeding colonies. Observations of tricolored blackbirds indicate that they require some free water in addition to insects. Various reports also noted unexplained abandonment of entire colonies at advanced stages of nesting, which may have been caused by insufficient food supplies to support their young (Beedy and Hamilton 1999). These birds forage and roost in large flocks and breed in large colonies. The tricolored blackbird forms the largest colonies of any North American passerine bird (Beedy and Hamilton 1999).

During nesting season, tricolored blackbird males spend a large majority of their day defending the nest and establishing a territory. Male birds spend approximately 50% of their time defending their nest while it is being built and the eggs are being laid. This is twice as much time as red-winged blackbirds, which spend about 25% of their time defending the nest (Beedy and Hamilton 1999; Yasukawa and Searcy 1995). As the breeding season continues, the male spends less time defending its territory and more time foraging. Since the tricolored blackbird may travel several miles to forage and procure food for the nestlings, there is little time and energy left for defense. The tricolored blackbird leaves the roost anywhere from a half-hour before sunrise to a half-hour after, and, after a day spent foraging, the birds will arrive back at the roost around sunset (Beedy and Hamilton 1999).

Tricolored blackbirds generally construct their nests close together within the nesting colony, and nests have been reported within 1.5 feet of each other (Neff 1937). They are an itinerant species, changing nesting locations from year to year, and often nesting at more than one location during the breeding season. Although they often change nesting locations, tricolored blackbirds require secure nesting substrates, water, and suitable foraging habitats for breeding (Beedy and Hamilton 1999). Because this species nests in colonies, it is susceptible to massive nest destruction and failure from predators such as hawks and mammals.

Breeding occurs mid-April into late July. The clutch size is typically three to four eggs, with clutches of two and five eggs observed occasionally (Emlen 1941). The first egg is usually laid the day after the nest is completed, occasionally before; and one egg is laid per day for 1 to 5 days (Emlen 1941). Tricolored blackbirds may raise two broods per year (Beedy and Hamilton 1999). Incubation lasts about 11 days and the young are tended by the female or by both parents (Lack and Emlen 1939). The young leave the nest at about 13 days (Beedy and Hamilton 1999).

Beedy and Hamilton (1999) state that there are no annual survivorship studies of the tricolored blackbird, and available banding data are inadequate to determine the actual annual survivorship; however, they cite banding studies that indicate that tricolored blackbirds can live for at least 12 years, and in some cases 13 years (Beedy and Hamilton 1999).

Distribution and Population Trends

The tricolored blackbird has a relatively restricted range, breeding from southern Oregon and the Modoc Plateau of northeastern California, south through the lowlands of California west of the Sierra Nevada to northwestern Baja California (Beedy and Hamilton 1999). The species is not migratory but is nomadic and highly colonial, although the nomadic pattern is poorly known (Orians 1960). Large flocks appear suddenly in areas from which they have been absent for months; they breed, and then quickly withdraw. This is known as itinerant breeding (Orians 1960; Beedy and Hamilton 1999).

The vast majority (99% of the population) of tricolored blackbirds reside within California (Beedy and Hamilton 1999). Populations in California generally inhabit the same area all year round, and do not need additional wintering sites, but most populations have been restricted to the Central Valley and surrounding foothill, coastal, and some inland localities in Southern California. Since 1980, active breeding colonies have been observed in 26 California counties, and most of the largest colonies are in the Central Valley (Beedy and Hamilton 1999). Within California, the tricolored blackbird breeds locally west of the Cascade Range, Sierra Nevada, and southeastern deserts, from Humboldt and Shasta Counties south to extreme southwest San

Bernardino County, western Riverside County, and western and southern San Diego County. In central California, breeding extends east into the foothills of the Sierra Nevada. It also breeds in the marshes of Klamath Basin in Siskiyou and Modoc Counties and Honey Lake Basin in Lassen County (Beedy and Hamilton 1999). It is a summer resident in northeastern California, occurring regularly only at Tule Lake, but has bred some years as far south as Honey Lake and in the marshes of the Klamath Basin in Siskiyou and Modoc Counties (Zeiner et al. 1990b). In the southern deserts, it is found regularly only at Antelope Valley, Los Angeles County. In winter, it becomes more widespread along the central coast and San Francisco Bay area (Beedy and Hamilton 1999; Garrett and Dunn 1981).

The tricolored blackbird is not migratory over most of its range, but it leaves Oregon, northeastern California, Santa Barbara County, and eastern San Diego County in fall and winter, presumably migrating south (Zeiner et al. 1990b; Beedy and Hamilton 1999). Flocks of the species become nomadic in fall, seeking food (Zeiner et al. 1990b). In winter, flocks become more widespread from Marin to Santa Cruz Counties, and in the Sacramento River Delta (Zeiner et al. 1990b). Although the distributional extent of the tricolored blackbird breeding range has remained relatively stable since the 1930s, recent statewide censuses have shown dramatic declines in tricolored blackbird numbers in the Central Valley, where the largest colonies have been observed (Beedy 2008). Numbers of tricolored blackbird adults in California documented during late-April surveys declined from 369,359 in 1994 to 162,508 in 2000 (Beedy 2008). Surveys focused on large colonies conducted in 2004 found that only 33 of the 184 previously documented colonies supporting over 2,000 adults remained active, and only 13 colonies still supported over 2,000 adults (Beedy 2008). Other censuses showed that colonies with fewer than 1,000 adults had increased from 25% in the 1930s to almost 67% in the 1980s, and colonies with more than 10,000 adults had dropped from 12% to 3% (Beedy and Hamilton 1999). The estimated population in California in 2005 was approximately 260,000 adults (The Tricolored Blackbird Working Group 2007).

Reasons for Decline

The main reasons for decline of the tricolored blackbird are habitat loss and degradation, primarily as a result of human activity (Beedy 2008). Substantial portions of the Central Valley, where 90% of the tricolored blackbird population is located, have been converted from suitable nesting and foraging habitat for the species to unsuitable conditions by agriculture and urbanization (Beedy 2008). In particular, large-scale conversion of grasslands and pasture to vineyards has substantially reduced suitable foraging habitat (Beedy 2008).

Nesting failure and abandonment of nesting colonies has occurred for a number of reasons. Localized abandonment of active nests has been observed where colonies were entered and human-related activities occurred adjacent to the colony for several hours (Beedy and Hayworth 1992). Tricolored blackbirds are susceptible to massive nest destruction and failure from predators because of their colonial nesting pattern (Beedy et al. 1991; Beedy 2008). Predators of tricolored blackbirds include a variety of birds, mammals, and reptiles, including black-crowned night-herons, common ravens, and coyotes. This problem may increase as the continued loss of wetlands and other nesting habitat forces nesting colonies into confined areas. In fact, even as far back as 1937, it was concluded that the destruction of nesting habitats by man is of more importance, and that reclamation and drainage have destroyed many favorable habitats, while other habitats have been destroyed by the dredging or cleaning of reservoirs, marshes, and canals (Neff 1937). DeHaven et al. (1975) found fewer colonies, smaller colonies, and an overall smaller population size in California than that documented by Neff (1937). This decline has been attributed to the loss of suitable nesting habitat for the tricolored blackbird (DeHaven et al. 1975).

A principal factor implicated in the population decline and the loss of individual colonies is elimination of wetland habitat, which has drastically reduced available nesting and foraging habitat (Beedy et al. 1991). Water management may increase predator access to active colonies by withdrawing water in freshwater marshes (Beedy 2008). The smaller colonies that have resulted from this reduced nesting and foraging habitat may be more vulnerable to disturbance by natural predators and also less able to compete with other species for the limited wetland nesting habitat. Higher rates of nesting failures and lower reproductive success have been observed in small colonies when compared to large colonies (Orians 1960; Payne 1969).

Poisoning, either deliberate or indirect, and increased disturbance by humans from agriculture operations such as harvesting have also been cited as contributing to the continued population decreases (Beedy et al. 1991). Tricolored blackbirds have shown reproductive failure as a result of pesticides and other toxins. Beedy and Hayworth (1992) observed almost complete nesting failure of a large colony (about 47,000 adults) in 1986 at Kesterson Reservoir, Merced County, an area contaminated by selenium deposited from agricultural drainage water. At a Kern County colony, all eggs sprayed with mosquito abatement oil failed to hatch (Beedy 2008). The loss of at least two colonies has been attributed to aerial herbicide applications (Beedy 2008). Strychnine was used to poison 30,000 birds in the early 1930s as an agricultural experiment (Beedy 2008).

5.2.2.9.2 HABITAT CHARACTERISTICS AND USE

The tricolored blackbird forms the largest colonies of any North American passerine bird. This behavior results in specific habitat requirements. These colonies require nearby water, a suitable nesting substrate, and open-range foraging habitat composed of grassland, woodland, or agricultural cropland. In winter, they often form single-species, and sometimes single-sex, flocks, but they also flock with other blackbird species. They often change their nesting locations from year to year. These changes may be an adaptation to exploit rapidly changing environments in ephemeral habitats, provide secure nesting sites, and provide plentiful insect food supplies (Beedy and Hamilton 1999).

In the Central Valley, large colonies generally occur in the rice lands of the Sacramento Valley and pasture lands of the lower Sacramento Valley and San Joaquin Valley. Colonies outside the Central Valley occur in several different habitat types, including those surrounded by chaparral-covered hills, sagebrush grasslands (which may extend for miles), or orchard, or those adjacent to salt marsh (DeHaven et al. 1975).

The tricolored blackbird prefers to breed in freshwater marshes with dense growths of emergent vegetation dominated by cattails (*Typha* spp.) or bulrushes (*Schoenoplectus* spp.), but have also established colonies in willows, blackberries (*Rubus* spp.), thistles (*Cirsium* and *Centaurea* spp.), and nettles (*Urtica* sp.). More recently, the breeding habitat has included diverse upland and agricultural areas. Many colonies have been reported in Himalayan blackberries (*Rubus discolor*).

Other nesting substrates include giant reed; safflower (*Carthamus tinctorius*); mustard (*Brassica nigra*); stinging nettles (*Urtica dioica*); tamarisk; riparian scrublands and forests (e.g., willows, Fremont cottonwood, California ash [*Fraxinus latifolia*]); mulefat; desert olive (*Forestiera neomexicana*) groves; and spiny field plants, such as wheat (*Triticum* spp.), barley (*Hordeum* spp.), and thistles. Dairies and feedlots are components of many tricolored blackbird breeding habitats. They construct nests of grasses, reeds, and cattails, and require open-range foraging habitat composed of grassland, woodland, or agricultural cropland (Beedy and Hamilton 1999).

5.2.2.9.3 OCCURRENCE IN THE COVERED LANDS

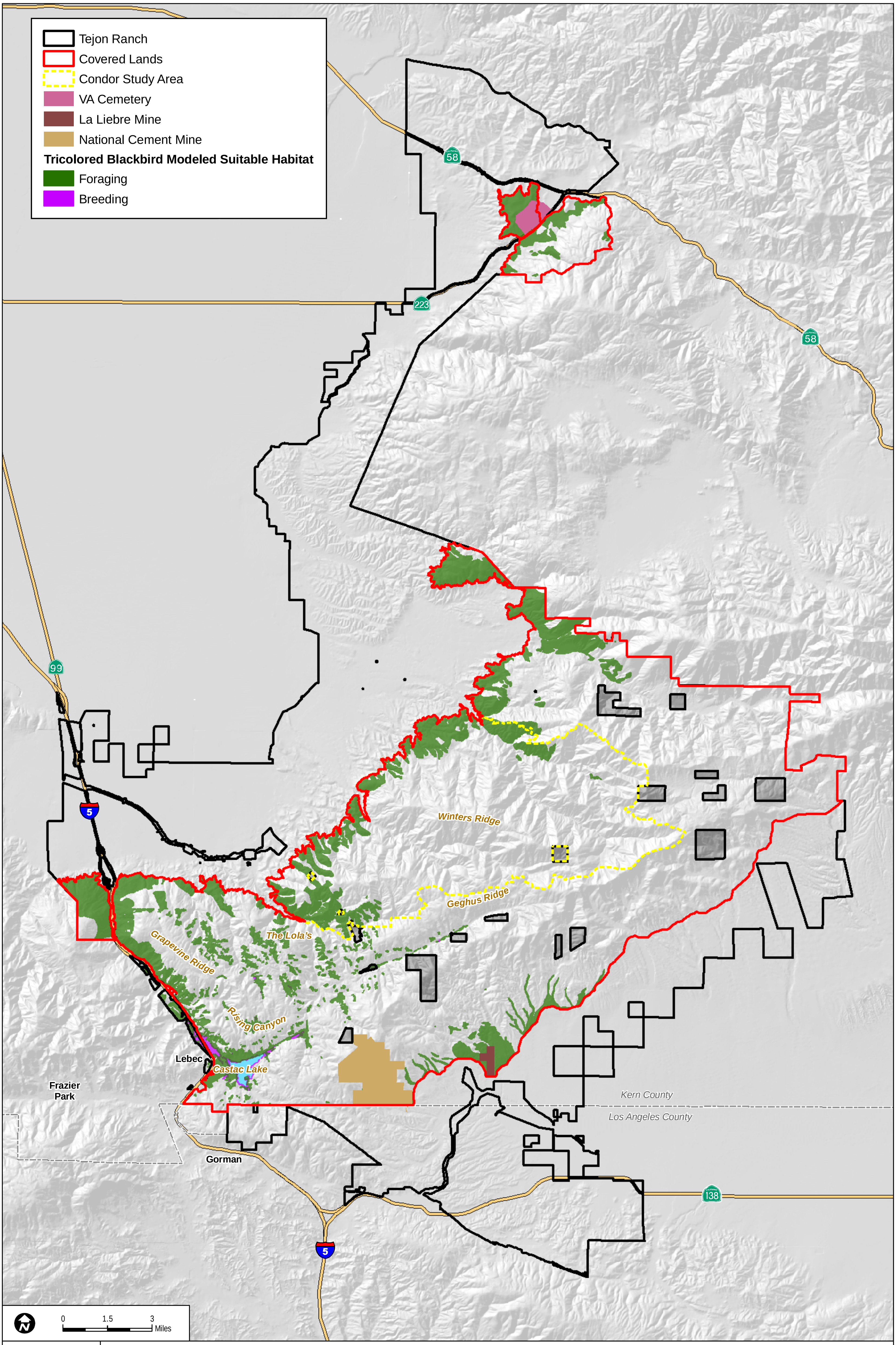
A focused survey for aquatic and marsh-dwelling bird species, including tricolored blackbird, was conducted in 2007 by Dudek on the margins of Castac Lake and Grapevine Creek in the TMV Planning Area to determine if aquatic and marsh-dwelling special-status birds breed on site or in areas directly adjacent to the TMV Planning Area (Dudek 2009). The surveys were conducted throughout the breeding season in May and June 2007. See *Appendix D.1* for more detailed information on survey methods.

Approximately 15 adult tricolored blackbirds were documented nesting around Castac Lake during the field survey in May 2007. Individuals were documented with nestlings and feeding young during surveys. No nesting behavior was observed during subsequent surveys on June 11–12, 2007 (Dudek 2009). Small numbers of tricolored blackbird were observed in 1999, 2000, 2001, 2003, and 2004 around Castac Lake and once in a marshy area at the upper end of Rising Canyon (Impact Sciences, Inc. 2004). Tricolored blackbird was also observed nesting in 2005 in the northwest corner of Castac Lake (Jones and Stokes 2006a). Based on these results, the tricolored blackbird is presumed to be a regular breeder at Castac Lake and could potentially nest in other suitable breeding habitat within the Covered Lands, although the nesting population is expected to be small (large nesting colonies in the Central Valley may number more than 100,000 adults) (Beedy 2008).

Because tricolored blackbirds have been observed nesting and foraging in the TMV Planning Area, there is a high potential for the species to forage on Covered Lands.

Suitable habitat for tricolored blackbird was modeled for all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable breeding habitats on Covered Lands are riparian/wetland and wetlands. Modeled suitable foraging habitats on Covered Lands are grasslands, agriculture, wash, riparian woodland, and riparian scrub. The habitat model also included an upper elevation threshold of 4,000 feet.

Modeled suitable habitat within Covered Lands for tricolored blackbird is shown in *Figure 5-14, Tricolored Blackbird Modeled Suitable Habitat*. A total of 18,553 acres of foraging habitat and 289 acres of primary breeding habitat (all associated with Castac Lake) for tricolored blackbird was modeled for Covered Lands. However, due to the absence of modeled breeding habitat on Covered Lands outside of the TMV Planning Area, the potential for breeding on Covered Lands outside of the TMV Planning Area is very low.



SOURCE: TRC 2007

FIGURE 5-14

Tricolored Blackbird Modeled Suitable Habitat

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5.2.2.10 WESTERN YELLOW-BILLED CUCKOO

The western yellow-billed cuckoo is a member of the avian family *Cuculidae* (cuckoos and relatives). This subspecies is one of two recognized subspecies of yellow-billed cuckoo (the other being *C. a. americanus*) (Hughes 1999). The western subspecies is considered to include yellow-billed cuckoos from the area west and north of west Texas to the Pacific Coast. The subspecies differ in breeding range and appearance (Franzreb and Laymon 1993; Hughes 1999).

Yellow-billed cuckoos are slender, medium-sized birds with a long tail with three large white spots along the edges. Yellow-billed cuckoos are dull brown–black with a whitish underside and rufous in the wings. The bill is black above with a yellowish lower mandible. The eyes are dark with a ring of gray skin around them and yellow eyelids. The legs are gray. Sexes of this species are similar in appearance except that females are slightly larger. Juveniles resemble adults, but with a less distinct tail pattern (Cornell Lab of Ornithology 2003). The western yellow-billed cuckoo is distinguished from *C. a. americanus* by being slightly grayer-brown on the dorsal surface, especially on the crown, and having an orange–yellow rather than yellow lower mandible (Hughes 1999). In addition, western yellow-billed cuckoos are smaller, particularly in the wings and bill (Hughes 1999).

5.2.2.10.1 STATUS AND DISTRIBUTION

Regulatory History

The western yellow-billed cuckoo was state listed as endangered in 1988. This subspecies is also a candidate for Federal listing (CDFG 2011b). It is also protected under the Federal MBTA (16 U.S.C. 703–712).

Natural History

The western yellow-billed cuckoo moves furtively through dense foliage of trees and shrubs in search of large insects, including cicadas, katydids, and caterpillars (Hamilton and Hamilton 1965). The western yellow-billed cuckoo is primarily a foliage gleaner, although it may venture out from a perch and catch flying prey or drop to the ground to catch grasshoppers or tree frogs (Laymon 1998).

Western yellow-billed cuckoos nest in humid, dense thickets. Their nests are built on horizontal branches in trees, shrubs, and vines, where they build a flimsy nest of open twigs. Cuckoos lay their eggs from mid-June to mid-July with an average clutch of three to four eggs. Incubation lasts for 9 to 11 days and young may leave the nest after 6 to 9 days. Western yellow-billed cuckoos are monogamous and both sexes incubate and care for the young (Zeiner et al. 1990b).

The western yellow-billed cuckoo requires relatively large blocks of riparian habitat for nesting. In the Sacramento River Valley, this subspecies occupied home ranges varying from 20 to 100 acres or more of riparian habitat (Gaines 1974; Laymon and Halterman 1987). Home ranges in the south fork of the Kern River averaged about 42 acres (Laymon et al. 1993).

Distribution and Population Trends

The yellow-billed cuckoo species, as a whole, summers and nests from interior California east to New Brunswick and sporadically southward to southern Mexico. The species presumably migrates throughout much of North America and winters primarily from northern to central South America (AOU 1998).

The northern limit of breeding for the western yellow-billed cuckoo in the coastal states is now in Sacramento Valley, California; the northern limit of breeding in the western interior states is southern Idaho (66 FR 38611–38626). Within California, the western yellow-billed cuckoo is an uncommon to rare summer resident of valley-foothill and desert riparian habitats in scattered locations (Zeiner et al. 1990b). It breeds along the Colorado River; in the Sacramento and Owens Valleys; along the south fork of the Kern River, Kern County; along the Santa Ana River, Riverside County; and along the Amargosa River, Inyo and San Bernardino Counties (Zeiner et al. 1990b). It may also nest along the San Luis Rey River, San Diego County. It usually arrives from South American wintering areas in June and departs by late August or early September (Zeiner et al. 1990b).

Western region Breeding Bird Survey (BBS) data indicate that western yellow-billed cuckoo populations declined 4.7% per year on average from 1966 to 1996 (Laymon 1998). However, there are too few BBS data to determine current population trends for California (Laymon 1998). Western yellow-billed cuckoo was once considered common to numerous in the Sacramento Valley, along the southern coast of California from Ventura to Los Angeles Counties, and in Kern County in the late 1800s, but it was considered only fairly common by the 1920s (Gaines and Laymon 1984). The western yellow-billed cuckoo suffered substantial range reductions in the 20th century due to loss of riparian habitat (Laymon and Halterman 1987). The numbers of yellow-billed cuckoos in California and other western areas had declined markedly into the 1980s with loss of riparian habitats (Laymon and Halterman 1987). The species was extirpated north of Sacramento Valley by the 1950s (Gaines and Laymon 1984). There has not been a systematic statewide survey of western yellow-billed cuckoo in California since 1987, but the most recent estimate showed a decline from 123–163 pairs in 1977 to 30–33 pairs in 1987, or a 73%–82% decline over this 10-year time period (Laymon 1998).

Reasons for Decline

Previously, western yellow-billed cuckoos nested nearly throughout the lowlands of Southern California and were, at one time, fairly common to common in some areas (Grinnell and Miller 1944). Numbers in California and other western areas have declined markedly in recent decades with destruction of riparian habitats (Laymon and Halterman 1987). The principal causes of riparian habitat losses are conversion to agriculture and other uses, dams and river flow management, stream channelization and stabilization, and livestock grazing. Available breeding habitats for the western yellow-billed cuckoo have also been substantially reduced in area and quality by groundwater pumping and the replacement of native riparian habitats by invasive plants, including tamarisk and giant reed.

Fragmentation of riparian habitat also reduces the quality of the riparian habitat for the western yellow-billed cuckoo. Fragmentation results in the loss of patches large enough to sustain local populations, leading to local extinctions and the potential loss of migratory corridors, which may affect the ability of the species to recolonize habitat patches (66 FR 38611–38626). Habitat fragmentation in California has been shown to exclude individuals where patch size is less than 328 feet by 984 feet (Hughes 1999).

Overuse of riparian habitat by livestock has been a factor in the degradation and modification of riparian habitats in the western United States. The effects include changes in vegetation community structure and species composition, as well as the relative abundance of species and plant density. These changes are often linked to more widespread changes in watershed hydrology and in some drainages may cause water flows to become sub-surface for some length of the stream (Ortega, pers. comm. 2001).

In areas where riparian habitat borders agricultural lands, pesticide use may affect western yellow-billed cuckoos indirectly by reducing prey numbers or directly by poisoning nestlings if sprayed in areas where the birds are nesting (66 FR 38611–38626). Pesticides may also affect behavior (loss of balance) (Hughes 1999).

5.2.2.10.2 HABITAT CHARACTERISTICS AND USE

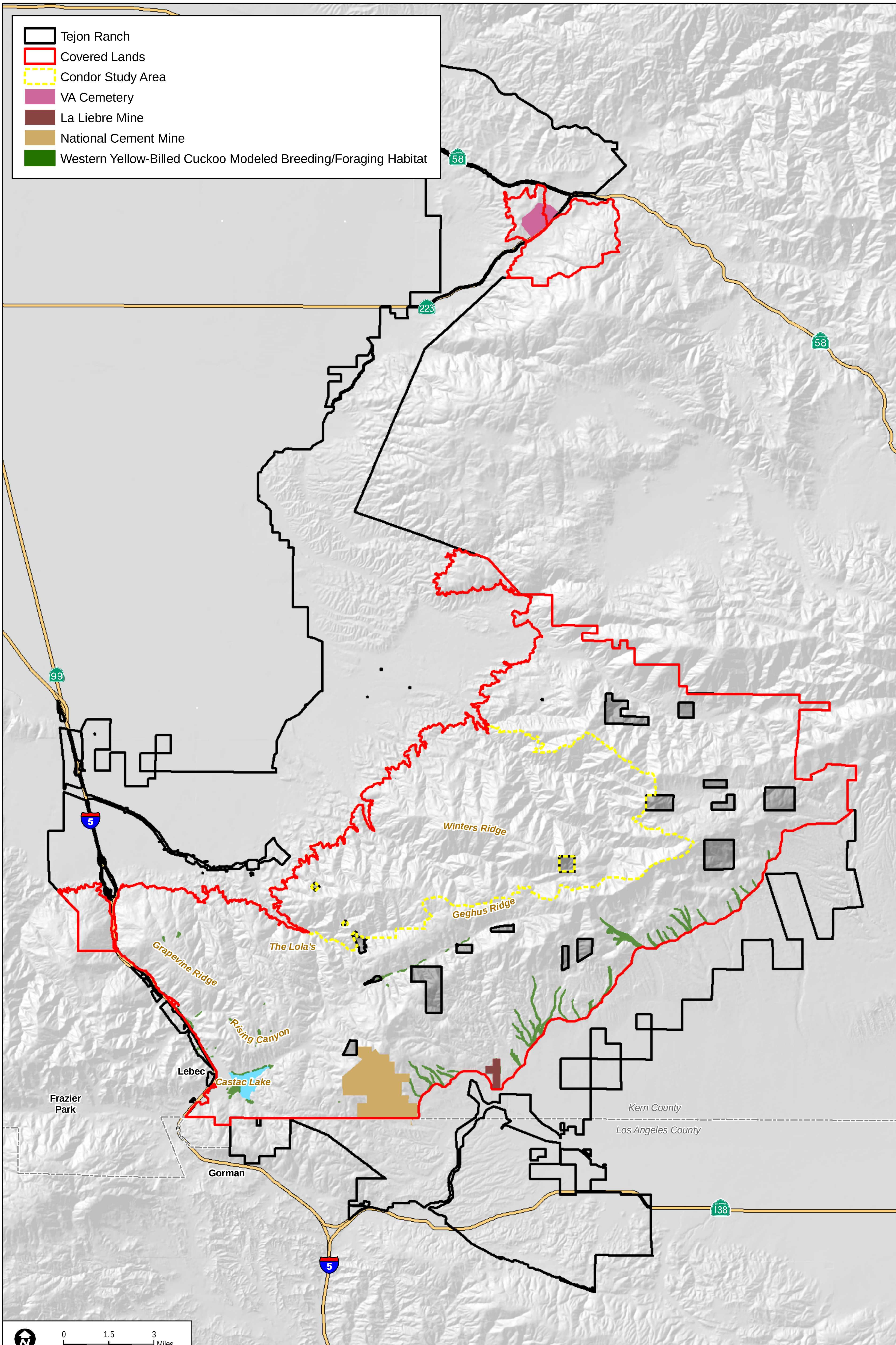
The full yellow-billed cuckoo species nests in a variety of habitats, including open woodland, parks, and riparian woodland (AOU 1998). By contrast, the western yellow-billed cuckoo in California requires dense, wide riparian woodlands with well-developed understories for breeding (Garrett and Dunn 1981). During breeding, the western yellow-billed cuckoo is restricted to river bottoms and other mesic habitats where humidity is high and where the dense understory abuts slow-moving watercourses, backwaters, or seeps (Zeiner et al. 1990b). Willow is almost always a dominant component of the vegetation. However, yellow-billed cuckoos have been observed in mesquite thickets along the Colorado River and orchards in the Sacramento Valley (Zeiner et al. 1990b). In arid regions, individuals are restricted to river bottoms, ponds, swampy areas, and damp thickets, with nesting occurring in willow, cottonwood, and mesquite (Hughes 1999).

5.2.2.10.3 OCCURRENCE IN THE COVERED LANDS

Focused surveys for western yellow-billed cuckoo were conducted in 2007 in all suitable habitat, including breeding habitat, within the TMV Planning Area. The survey method for determining presence or absence of the western yellow-billed cuckoo followed the Halterman and Johnson (2003) draft protocol. A total of four survey visits were made to the suitable habitat during the breeding season between June 15 and August 17, at approximately 10- to 14-day intervals. Western yellow-billed cuckoo was not observed in the TMV Planning Area. Nests were not documented on site during the 2007 focused surveys or in previous years. A survey was also conducted for western yellow-billed cuckoo in the Beartrap Turnout Improvement Project study area in May to July 2011 in conjunction with the vireo and willow flycatcher surveys (Dudek 2011a). Western yellow-billed cuckoo was not observed in the 2011 survey. See *Appendix D.1* for more detailed information on survey methods.

Suitable habitat for western yellow-billed cuckoo was modeled for all Covered Lands. Modeled suitable breeding/foraging habitats on Covered Lands include riparian scrub, riparian woodland, riparian/wetland, and wash. Available data did not allow identification of vegetation structure within individual polygons.

Modeled suitable habitat within Covered Lands for western yellow-billed cuckoo is shown in *Figure 5-15*, *Western Yellow-Billed Cuckoo Modeled Suitable Habitat*. A total of 986 acres of breeding/foraging habitat for western yellow-billed cuckoo was modeled for Covered Lands. Because of the negative survey results in the TMV Planning Area, overall rarity of the species, and limited amount of suitable habitat with appropriate patch size and configuration, the potential for western yellow-billed cuckoo to nest or forage on Covered Lands is very low. In addition, because it is unlikely that all modeled suitable habitat would be saturated and because it is assumed that some modeled suitable habitat may not contain the microhabitat nesting criteria required by this species, not all modeled suitable habitat is expected to be occupied by this species, if it occurs.



SOURCE: TRC 2007

FIGURE 5-15

Western Yellow-Billed Cuckoo Modeled Suitable Habitat

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5.2.2.11 WHITE-TAILED KITE

White-tailed kites (*Elanus leucurus*) belong within the *Accipitridae* family of raptors, along with ospreys, hawks, and eagles. The white-tailed kite was merged briefly with the black-shouldered kite (*E. caeruleus*) but was determined to differ from the Old World Kites in greater size and weight, in proportions (relatively longer tail and smaller bill and feet), and in plumage pattern (particularly of the juveniles). These distinctions warranted recognition of the white-tailed kite at the species level (Clark and Banks 1992).

White-tailed kites are approximately 14.5 inches in length and have a wingspan of up to 40 inches. Males and females are similar in size and attributes. Adults of both sexes are white and have pointed wings; long squared-off tails; a short, dark, hooked beak; red eyes; and a black upper wing that looks like a black shoulder when the bird is not in flight. Juvenile white-tailed kites have a brown head, nape, and back with a white face and brown streaks down their white breast. Similar to adults, juveniles have a dark upper wing but they also have a dark band at the tip of their white tail (Gough et al. 1998).

5.2.2.11.1 STATUS AND DISTRIBUTION

Regulatory History

The white-tailed kite became a Fully Protected species in California in 1957 (Waian and Stendell 1970). The species is also protected under the Federal MBTA (16 U.S.C. 703–712).

Natural History

The white-tailed kite preys mostly on voles and other small, diurnal mammals, and occasionally on birds, insects, reptiles, and amphibians. It preys on small mammals approximately 95% of the time and can be considered a small-mammal specialist (Dunk 1995). It forages in undisturbed, open grasslands; meadows; farmlands; emergent wetlands; ungrazed grasslands; fence rows and irrigation ditches adjacent to grazed lands; shrub; scrub; and open woodlands (Dunk 1995). Hunting activity patterns are generally similar throughout its range, with hunting success in approximately 40% to 50% of attempts at prey (Mendelsohn and Jaksic 1989). It soars, glides, and hovers less than 100 feet above the ground in search of prey. It hunts almost exclusively by hovering from 16 to 82 feet (5 to 25 meters) in height. The hovering bouts last from 1 to 60 seconds, during which time the kite scans the ground beneath for prey. The white-tailed kite exhibits year-long diurnal and crepuscular activity, meaning they are primarily active during the day and at twilight (Zeiner et al. 1990b).

White-tailed kite pairs are found together year-round but more individuals are paired from December through August (Dunk 1995). The kite makes a nest of loosely piled sticks and twigs that are lined with grass, straw, or rootlets. The nest is placed near the top of a dense oak, willow, or other tree stand, usually 20 to 100 feet above the ground in trees that vary from 10 to 164 feet (3 to 50 meters) in height (Dixon et al. 1957). The nest is typically located near an open foraging area. Nest trees may be isolated or part of a contiguous forested area. Nest tree species are variable, with more than 20 species on record as having been used by the white-tailed kite. The tree structure apparently is the most important determinant for use for the nest site (Dunk 1995).

The white-tailed kite is monogamous; it breeds from February to October, with a peak from May to August. The average clutch is four to five eggs, with a range of three to six eggs. The female incubates for only about 28 days. The young fledge in 35 to 40 days. During the incubation and nestling period, the male feeds the female and supplies her with food to feed the young. This species is usually single-brooded but may occasionally have two broods. Nests are generally not reused in subsequent breeding seasons, although some reuse has been reported.

In a study conducted in the San Francisco Bay area of California, 1.6 white-tailed kite young were fledged per active nest and 2.9 were fledged per successful nest (Dunk 1995). The maximum lifespan recorded for the white-tailed kite is 5 years and 11 months (Clapp et al. 1982).

Although it is generally a resident bird throughout most of its breeding range, some dispersal occurs during the non-breeding season, resulting in some range expansion during the fall and winter. Two white-tailed kites banded as nestlings were recovered as adults 11 to 99 miles (19 to 160 kilometers) from their natal nests (Dixon et al. 1957). Because white-tailed kite populations often change in direct response to changing vole and rodent populations, kites are believed to become nomadic during low-abundance population cycles of California voles and small mammals (Dunk and Cooper 1994).

The white-tailed kite forages from a central perch over areas as large as 1.9 square miles (Warner and Rudd 1975). It seldom hunts more than 0.5 mile from the nest when breeding (Hawbecker 1942). Generally, it is not territorial, but the nest site may be defended against crows, other hawks, and eagles (Pickwell 1930; Dixon et al. 1957). The nest may be robbed by jays, crows, yellow-billed magpies, raccoons, and opossums. Great horned owls may prey on adults and young (Zeiner et al. 1990b). It has been hypothesized that kite territory size is proximately regulated by competitor abundance and ultimately regulated by prey abundance (Dunk and Cooper 1994). Communal roosts are used in the non-breeding seasons (Waian and Stendell 1970). Nest sites are also closely associated with suitable foraging habitat with high rodent populations in the immediate vicinity of the nest. Erichsen et al. (1996) described how successful nests are more often than not surrounded by preferred foraging habitat (particularly agriculture) within a 0.5-mile radius of the nest; Hawbecker (1942) noted that during the breeding season, kites seldom forage farther than a 0.5-mile radius from the nest site. Faanes and Howard (1987) recommend, based on home range data, that habitat models for the kite include areas of at least 50 acres of contiguous habitat. Documented white-tailed kite breeding densities average approximately one pair per 615 acres (Stendell 1972). The availability of prey, particularly voles, at the onset of breeding appears to influence kite breeding density.

Distribution and Population Trends

Although threatened with extinction in North America during the early 20th century, the white-tailed kite has recovered since then, expanding its range in the United States from small portions of California, Texas, and Florida to Oregon and Washington as well as into the middle portions of North America (Eisenmann 1971). Prior to the 1960s, this species occurred in low numbers across much of its range. Population decreases appeared to be common during this time, especially in Mexico and Central America; however, since 1960, the population status and range of this raptor in North America have improved markedly. The white-tailed kite has also rapidly colonized habitats throughout much of Central America in previously uninhabitable regions (Eisenmann 1971).

The breeding range stronghold for the white-tailed kite in North America is California, with nearly all areas up to the western Sierra Nevada foothills and southeastern deserts occupied (Small 1994; Dunk 1995). The kite is common in the Central Valley of California and along the entire length of the coast. Breeding has been documented regularly in the far west counties of Oregon, and has also been documented recently in southwest Washington. This species is a common breeder in southern Texas. A small breeding population of white-tailed kite has been established in southern Florida since at least 1986, with scattered reports elsewhere in the peninsula and in the eastern panhandle (Dunk 1995). This species' breeding range continues south along the coast in Mexico into Central America and in South America from Colombia south to the north coast of Argentina (Dunk 1995).

In California, the white-tailed kite is a common to uncommon, year-long resident in coastal and valley lowlands, rarely found away from agricultural areas (Grinnell and Miller 1944). It inhabits herbaceous and open stages of moist habitats, mostly in cismontane California. It has extended its range and increased its numbers in California in recent decades (Eisenmann 1971).

Although apparently a resident bird throughout most of its breeding range, dispersal occurs during the non-breeding season, resulting in some range expansion during the winter. It is believed to become nomadic during low abundance of California voles and its population changes in a regular and predictable fashion directly tied to changing vole numbers. However, in Northern California, this constitutes a migration movement or nomadic response to changes in the prey population (Dunk and Cooper 1994). Others have concluded it is apparently not migratory, but Binford (1979) found some movements in coastal California and the species may be observed sporadically throughout most of the state (Small 1994). It is a very uncommon to fairly common winter visitor to western Oregon, particularly along the coast and interior valleys, and a rare winter visitor to the western edge of the Great Basin (Dunk 1995).

It appears that the primary factor known to regulate kite populations is prey availability. The availability of nesting and roosting sites becomes important in areas where prey is not limited (Dunk and Cooper 1994). Within a 0.5-mile (0.8 kilometer) radius circle centered on the nest site, successful nests were surrounded by more natural vegetation and non-urban human development than failed nests (Erichsen et al. 1996).

Reasons for Decline

The California population of the white-tailed kite was historically reduced by habitat loss, shooting, and possibly egg collecting, and by the 1930s, extinction was predicted for this species (Pickwell 1930). Most of the changes in population numbers appear to be related to changes in the size of the prey base. Recent population declines may be related to reductions in the prey base due to the conversion of natural or agricultural lands to urban or commercial land uses. Other threats to kite populations include clean farming techniques that leave few residual vegetation areas for prey, increased competition for nest sites with other raptors and corvids, the loss of nest trees, and increased disturbances at the nest (Dunk 1995). A relatively long-term drought throughout California during much of the time period from 1982 to 1991 may have contributed to population declines during that time and for years afterward (Dunk 1995).

5.2.2.11.2 HABITAT CHARACTERISTICS AND USE

The white-tailed kite inhabits low-elevation, open grasslands; savannahs; agricultural areas; wetlands; and oak woodlands. Riparian areas adjacent to open areas are typically used for nesting (Dunk 1995). The white-tailed kite uses trees with dense canopies for cover; specific plant associations seem to be unimportant, with vegetation structure and prey abundance apparently more important (Dunk 1995). In California's Sacramento Valley, the kite has increased predominantly in irrigated agricultural areas where the California vole occurs (Warner and Rudd 1975). In Southern California, white-tailed kite also roosts in saltgrass (*Distichlis spicata*) and Bermuda grass (*Cynodon dactylon*). The species uses herbaceous lowlands with variable tree growth, shrubs, sparse chaparral, and almost any upland with sparse cover of shrubs to grassland with a dense population of voles (Waian and Stendell 1970). Substantial groves of dense, broad-leaved deciduous trees are used by white-tailed kite for nesting and roosting (Brown and Amadon 1968).

The winter habitat for the white-tailed kite is generally similar to the breeding habitat, but the proximity to nest trees is not as important during winter months. Ungrazed areas tend to be used more than grazed lands in the winter. Communal roosts in the fall and winter are generally in small stands of trees but have been observed in open fields on the ground and in orchards. The specific plant associations are not important for the roost sites (Dunk 1995).

5.2.2.11.3 OCCURRENCE IN THE COVERED LANDS

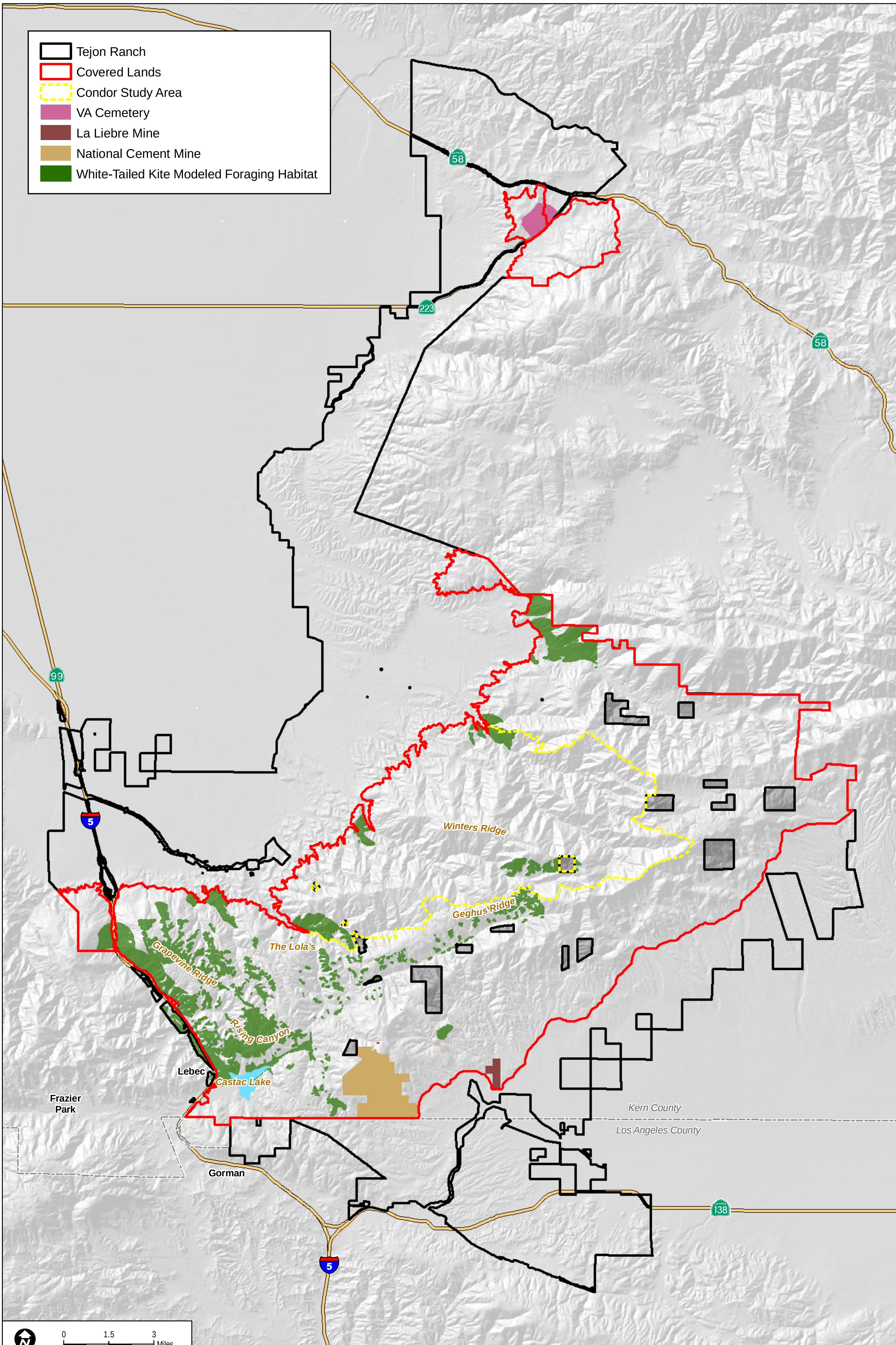
Surveys for special-status breeding raptors, including white-tailed kite, were conducted in the TMV Planning Area by Dudek during two time periods in 2007 (Dudek 2009). Raptor surveys were conducted using the methods described by Fuller and Mosher (1987), including early season driving and road surveys to identify nest locations, and follow-up driving, road, or pedestrian surveys to identify additional locations and provide nesting success information. The surveys focused on oak woodlands. In addition, chaparral was surveyed by road to supplement the oak woodland surveys. The first set of surveys was conducted early in the nesting period, with a total of 18 driving/road surveys conducted from March 6 through March 30, 2007. In general, most deciduous trees had not leafed out, so raptor nests were highly visible during this period. The second set of approximately 18 road and walking surveys was conducted from June 4 through July 6, 2007. Winter bird surveys were also conducted by Dudek in the TMV Planning Area in November 2006 (Dudek 2009). See *Appendix D.1* for more detailed information on survey methods.

White-tailed kite was observed foraging in the TMV Planning Area during wintering bird surveys in November 2006 and in March, April, and June 2007 during the species' breeding season (Dudek 2009). The species was observed west of Castac Lake and near Grapevine Creek on a number of occasions, but nesting activity was not observed during the 2007 breeding raptor surveys (Dudek 2009). The white-tailed kite was also observed during the spring in 2005, but the specific location of the observation was not reported (Jones and Stokes 2006a). The white-tailed kite was not included as a detected species during surveys between 1999 and 2004 (Impact Sciences, Inc. 2004). The white-tailed kite is not expected to nest within the Covered Lands because the species avoids areas that freeze (Dunk 1995). The Covered Lands are generally above 2,000 feet amsl on the north (San Joaquin Valley) side of the mountains and generally above 3,500 feet on the south (Antelope Valley) side. CNDDB records for breeding kites range in elevation from sea level to 640 meters amsl (sea level to 2,100 feet). Further, nesting white-tailed kites would have been observed during surveys because nests are conspicuous and young are easily detectable due to their coloration.

Suitable foraging habitat for white-tailed kite was modeled for all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable foraging habitat includes grasslands, agriculture, and wetlands within 1 kilometer (approximately 3,275 feet) of perennial streams and Castac Lake.

Suitable foraging habitat within Covered Lands for white-tailed kite is presented in *Figure 5-16, White-Tailed Kite Modeled Suitable Habitat*. A total of 9,009 acres of foraging habitat for white-tailed was modeled for Covered Lands.

As stated above, white-tailed kite is not expected to nest within the Covered Lands due to the location of the Tehachapi Mountain Uplands portion of the ranch (i.e., above 2,000 feet amsl) outside of the known breeding range. Because the white-tailed kite has been observed foraging in the TMV Planning Area, there is a high potential for this species to forage elsewhere on the Covered Lands. While foraging potential exists, because it is unlikely that all modeled foraging habitat would be saturated, and because suitable foraging areas may be farther from the suitable breeding areas than the species moves during the day, not all modeled suitable habitat is expected to be used by this species.



SOURCE: TRC 2007

FIGURE 5-16

White-Tailed Kite Modeled Suitable Habitat

Draft Tehachapi Uplands MSHCP

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5.2.2.12 YELLOW WARBLER

The yellow warbler (*Dendroica petechia brewsteri*) is in the perching birds order (*Passeriformes*) and the family of buntings and finches (*Fringillidae*). At one time, the yellow warbler was clumped with other warbler species into an overall classification of Golden Warblers. Currently, that singular group is separated into three subsections (Yellow Warbler, Golden Warbler, and Mangrove Warbler) consisting of 43 subspecies. Subspecies have been separated into two geographic groups using both molecular and plumage characteristics. These two groups are the *aestiva*, migratory yellow-headed forms of North America; and the *petechia* and *erithachorides*, sedentary chestnut-crowned and chestnut-headed forms from tropical regions (Lowther et al. 1999). The yellow warbler falls within the *aestiva* group (Yellow Warbler subsection), while the *petechia* and *erithachorides* group includes species within the Golden Warbler and Mangrove Warbler subsections (Lowther et al. 1999).

The yellow warbler is considered a medium-sized bird. Both male and female are yellow, with the male being a brighter yellow than the female. Both sexes also have brown streaks below their throats, but the streaks are lighter on the female. Juveniles of both sexes are duller images of their corresponding sex and have an overall green hue (Lowther et al. 1999).

5.2.2.12.1 STATUS AND DISTRIBUTION

Regulatory History

The yellow warbler is designated as a California Species of Special Concern by CDFG. Yellow warbler is not Federally listed as threatened or endangered but is protected under the Federal MBTA (16 U.S.C. 703–712).

Natural History

The yellow warbler feeds primarily on insects and other arthropods. There are three primary ways in which this species captures its food: gleaning, sallying, or hovering. Gleaning refers to taking insects located on a surface while perched; sallying refers to leaving a perching position and capturing the prey; and hovering is when the bird captures the prey while in flight but holding a position. According to Lowther et al. (1999), there are no known quantitative studies that describe the daily budget of yellow warblers. Zeiner et al. (1990b) describe the yellow warbler as participating in year-long diurnal activity and migrating at night.

Yellow warblers typically arrive from their wintering areas from late March to May. They tend to nest in locations of intermediate height and shrub density. The nest is built in an upright fork or crotch of a large tree, or sometimes a sapling or bush, generally 6 to 8 feet above the ground. The nest is a well-formed cup of interwoven plant fibers and down, fine grasses, lichens, mosses, spider silk, hairs, etc. The yellow warbler breeds solitarily from mid-April to early August, with peak activity in June with a clutch of three to six (four to five is common). The eggs are incubated for 11 days, and the young are tended by both parents until fledged at 9 to 12 days (Harrison 1978). The young breed the following year.

On the breeding grounds, the yellow warbler defends multipurpose territories (i.e., territories that meet more than one aspect of an individual's needs, including breeding, foraging, and cover). Territories reflect the area defended by a male and may include more than one breeding female. Territories are established as soon as the males arrive (Lowther et al. 1999). Territory interactions are dynamic, including overlap in use areas and boundary shifts that continue throughout the breeding season. The species tends to have relatively small territories and home ranges, varying from 0.08 to 0.5 acre (Lowther et al. 1999). Peak densities measured in southeast Arizona reached 119 birds per acre (Lowther et al. 1999).

Distribution and Population Trends

Yellow warblers as a whole nest from northern Alaska eastward to Newfoundland and southward to northern Baja California and Georgia. This species is a nocturnal migrant throughout much of North America and winters from Southern California, Arizona, and the Gulf Coast southward to central South America (AOU 1998). Rangewide in North America, the yellow warbler is still considered to be one of the most abundant warblers (Heath 2008). While no current specific population estimates are available, BBS data from the mid-1990s indicate a stable population rangewide, but with regional declines in the Pacific Northwest and California (Lowther et al. 1999). In the 1940s, the yellow warbler was described as a "common" to "locally abundant" breeder throughout California, except for most of the Mojave Desert and all of the Colorado Desert (Heath 2008). Although there have been several declines in local populations of yellow warbler, the limits of the yellow warbler's breeding range is similar to its historical range except in the Central Valley where it is close to extirpation (Heath 2008). The breeding range has also contracted locally in the Owens Valley within the Great Basin Desert. Breeding numbers of yellow warbler in California have significantly declined, especially in the lowland areas west of the Cascade–Sierra Nevada axis. However, the local abundance and long-term trends of this species vary widely by region (Heath 2008).

Reasons for Decline

Major continuing threats to the species include habitat destruction and fragmentation and brood-parasitism by brown-headed cowbirds (Lowther et al. 1999). Nest predation was found to be the major cause of nest failure in a group of species in Alaskan wetlands including yellow warblers (Lowther et al. 1999).

The major causes in the decline of the yellow warbler are habitat loss and degradation associated with urbanization (Heath 2008). In coastal areas, increases in human populations are associated with an increased demand for water resources, resulting in the degradation of riparian habitat for this species (Heath 2008). Yellow warbler abundances may also be reduced by fire prevention activities that clear or limit regrowth of montane chaparral (Heath 2008).

Intense cattle grazing can also result in habitat degradation and fragmentation, especially where willow growth along riparian habitats is reduced or removed, and has had a major impact on yellow warbler populations in the western United States (Taylor and Littlefield 1986). Management of cattle grazing in the western United States to maintain willow borders of riparian habitat helped to maintain yellow warbler populations (Taylor and Littlefield 1986).

Brood parasitism by brown-headed cowbirds has been cited as a major cause in the decline in yellow warbler numbers in lowland localities in recent decades (Lowther et al. 1999; Garrett and Dunn 1981; Remsen 1978). For example, parasitism occurred in nine of 25 nests or family groups in the Sierra Nevada where cowbirds were common (Lowther et al. 1999). Populations along the stretch of the Salinas River in Monterey County declined 50% in 1980s; the decline was attributed to loss of riparian habitat and increase of brown-headed cowbirds (Lowther et al. 1999). The yellow warbler frequently responds to cowbird parasitism by building over the parasitized clutch, making multi-tiered nests. The yellow warbler is more likely to desert or bury the cowbird egg if the cowbird egg appears before any warbler egg or early in the laying sequence (Lowther et al. 1999). Further, cowbird management programs, specifically to aid least Bell's vireo populations in Riverside County, resulted in increased yellow warbler numbers (Lowther et al. 1999). However, the assumption that brood parasitism is major cause of decline is not always supported by regional data because successful reproduction can occur in areas with high parasitism rates (Heath 2008). For example, yellow warbler densities at Mono Lake restoration sites are increasing despite relatively high parasitism rates and lack of cowbird management, indicating that yellow warblers are somewhat resistant to the demographic effects of brood parasitism (Heath 2008).

Nest predation has also been found to be a major cause of nest failure in a group of species in Alaskan wetlands including yellow warblers (Lowther et al. 1999), and in the northern and eastern Sierra, where nest failure was positively correlated with the activity rates of Douglas squirrels, Steller's jays, and brown-headed cowbirds. The proximity of the nest to trees and forest edges likely increased access to the nest by predators (Heath 2008), thereby making habitat fragmentation and associated increases in edge habitats a potential threat to this species.

Because this species is a nocturnal migrant, they also are occasionally killed during migration in collisions with TV towers and other tall, lighted structures; but this occurs relatively less often than with most other migrant parulids (Lowther et al. 1999).

5.2.2.12.2 HABITAT CHARACTERISTICS AND USE

In general, the yellow warbler breeds most commonly in wet, deciduous thickets, especially those dominated by willows, and in disturbed and early successional habitats (Lowther et al. 1999).

Yellow warblers in Southern California breed in lowland and foothill riparian woodlands dominated by cottonwoods, alders, willows, and other small trees and shrubs typical of low, open-canopy riparian woodland (Garrett and Dunn 1981). The territory often includes tall trees for singing and foraging and a heavy brush understory for nesting (Lowther et al. 1999). The yellow warbler is found at elevations from 328 to 8,856 feet amsl (100 to 2,700 meters) within riparian habitat and at higher elevations along watercourses with riparian growth (Lowther et al. 1999).

During migration, yellow warblers occur in lowland and foothill woodland habitats, such as desert oases, riparian woodlands, oak woodlands, mixed deciduous–coniferous woodlands, suburban and urban gardens and parks, groves of exotic trees, farmyard windbreaks, and orchards (Small 1994). The yellow warbler also breeds in montane chaparral, open ponderosa pine, and mixed conifer habitats with substantial amounts of brush (Zeiner et al. 1990b). Breeding in montane shrubs and conifers is perhaps a recent phenomenon (Gaines 1977). In migration, the bird visits woodland, forest, and shrub habitats. It usually arrives in California in April, and generally has migrated out of the area by October. Apparently there is a post-breeding upslope movement mostly to middle elevations (Zeiner et al. 1990b); yellow warbler is scarce at elevations above 8,000 feet amsl (Gaines 1977). Small numbers regularly overwinter in Southern California lowlands (Garrett and Dunn 1981).

5.2.2.12.3 OCCURRENCE IN THE COVERED LANDS

Surveys for yellow warbler were conducted in the TMV Planning Area in 2007 by Dudek in conjunction with focused surveys for Federally and/or state-listed riparian birds (i.e., least Bell's vireo, willow flycatcher, and western yellow-billed cuckoo) (Dudek 2009). The surveys were divided into four survey areas due to the size and the distribution of suitable habitat on the site, and generally included riparian habitat adjacent to Castac Lake, in Cuddy Creek, and in suitable riparian habitat patches located in Beartrap Canyon and Rising Canyon (Dudek 2009). A focused survey was also conducted for riparian birds in the Beartrap Turnout Improvement Project study area in May to July 2011 (Dudek 2011a). See *Appendix D.1* for more detailed information on survey methods.

Yellow warbler was observed in 2007 during the species' breeding season within suitable riparian breeding habitat within and adjacent to Castac Lake and in riparian areas in Beartrap Canyon within the TMV Planning Area (Dudek 2009). Although no nest locations were detected during the 2007 surveys (Dudek 2009), this species is expected to nest in the TMV Planning Area because individuals were detected during the breeding season and suitable breeding habitat is present. Prior to the 2007 focused surveys, yellow warbler had been observed in the TMV Planning Area in 2003 (Impact Sciences, Inc. 2004) and 2005 (Jones and Stokes 2006a); Impact Sciences, Inc. (2004) also noted historic observations of the species. Yellow warbler was also observed on one occasion in May 2011 in the Beartrap Turnout Improvement Project study area, but was not observed nesting (Dudek 2011a). It possibly was migrant or moved downstream for nesting (Dudek 2011a).

Suitable habitat for yellow warbler was modeled for all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable breeding/foraging habitats on Covered Lands are riparian woodland, riparian scrub, riparian/wetlands, and wash. Secondary foraging habitat was also modeled for the species and is defined as habitat that is adequate to meet some aspects of the species' life history (in this case foraging) but not all aspects of its life history (e.g., breeding). Modeled suitable secondary foraging habitats on Covered Lands are non-riparian woodlands and conifers.

Modeled suitable habitat within Covered Lands for yellow warbler is shown in *Figure 5-17, Yellow Warbler Modeled Suitable Habitat*. A total of 986 acres of breeding/foraging habitat and 51,743 acres of secondary foraging habitat for yellow warbler was modeled for Covered Lands. However, because it is unlikely that all modeled suitable habitat would be saturated, and because some modeled suitable habitat may not contain the microhabitat nesting criteria required by this species, not all modeled suitable habitat is expected to be occupied by yellow warbler.

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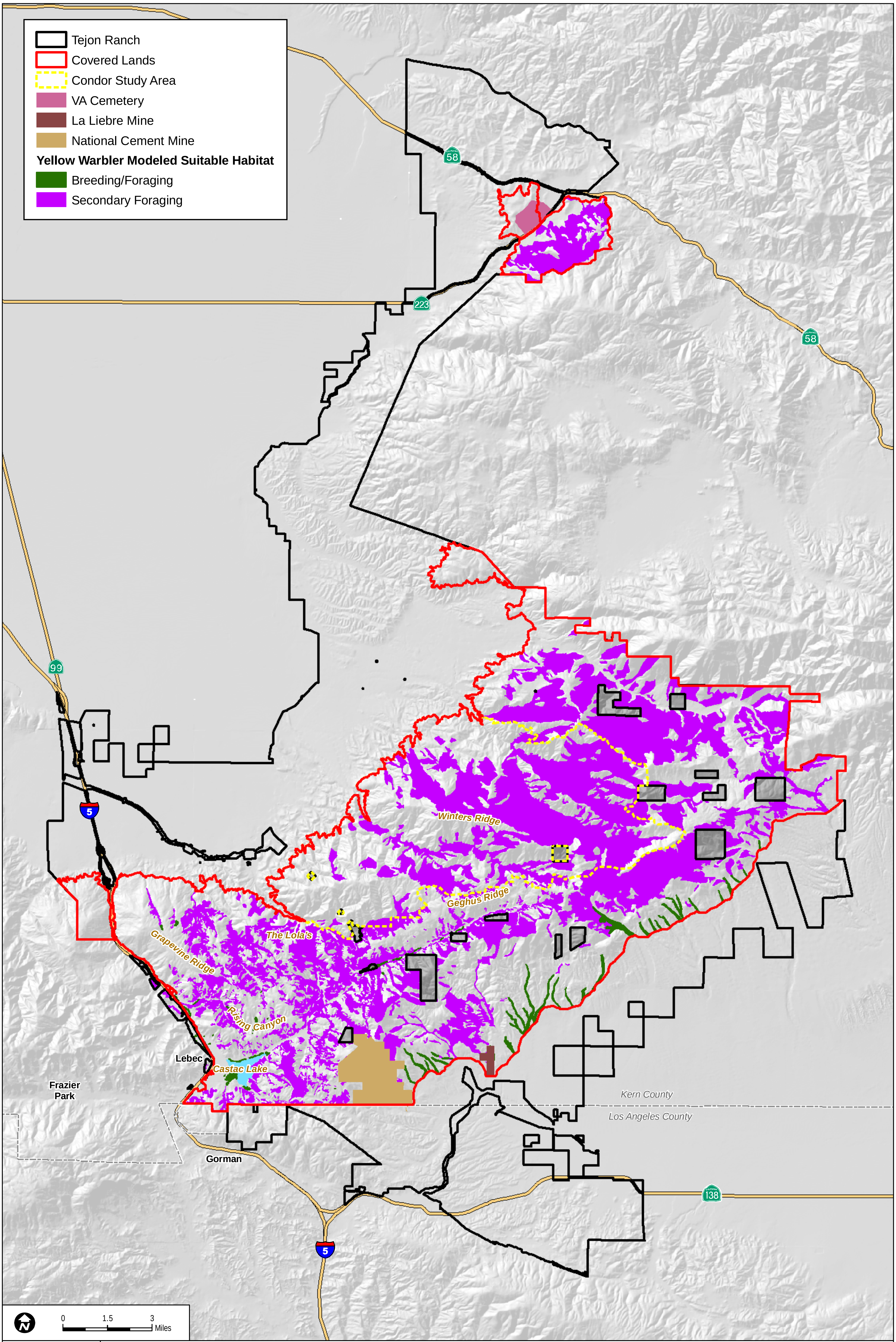

SOURCE: TRC 2007

FIGURE 5-17

Yellow Warbler Modeled Suitable Habitat

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5.2.3 INSECTS

5.2.3.1 VALLEY ELDERBERRY LONGHORN BEETLE

The elderberry longhorn beetle (*Desmocerus californicus*) is a member of the *Coleopteran* family *Cerambycidae*, and is one of three species of *Desmocerus* in North America (USFWS 1984c). Two subspecies of *Desmocerus californicus* have been described based on male coloration and geographic range: valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) and California elderberry longhorn beetle (*Desmocerus californicus californicus*) (Collinge et al. 2001). Female valley elderberry longhorn beetles look similar to California elderberry longhorn beetles, with dark, metallic green to black elytra[12] with a red border (USFWS 1984c; USFWS 2006b). However, in female valley elderberry longhorn beetles, the elytra do not fully cover the abdomen when viewed dorsally (USFWS 1984c). Males of the valley elderberry longhorn beetle exhibit polymorphism in color pattern (USFWS 1984c). Generally, male valley elderberry longhorn beetles have elytra that are predominantly red with four oblong, dark metallic spots. However, some male valley elderberry longhorn beetles resemble male California elderberry longhorn beetle individuals, while intergrades of the two color patterns also exist (USFWS 1984c; USFWS 2006b). Both the males and females of valley elderberry longhorn beetle appear to be smaller than the California elderberry longhorn beetle (USFWS 1984c), with male valley elderberry longhorn beetles measuring 0.5 to nearly 1 inch in length and females measuring from 0.75 to 1 inch (USFWS 1984c; USFWS 2007b).

5.2.3.1.1 STATUS AND DISTRIBUTION

Regulatory History

Valley elderberry longhorn beetle was Federally listed as a threatened species in 1980, with critical habitat designated at two locations in Sacramento County (45 FR 52803–52807), approximately 270 miles from the Covered Lands. There are no critical habitat designations within or adjacent to the Covered Lands. A Recovery Plan for valley elderberry longhorn beetle was published by USFWS in 1984 (USFWS 1984c). In response to a petition to delist based on that data and recommendation to delist in the 2006 Five-Year Status Review (USFWS 2006b), USFWS has made a 90-day finding that delisting may be warranted, triggering a 12-month review (76 FR 51929).

Natural History

The valley elderberry longhorn beetle, a wood borer, is completely dependent on its host plant, elderberry (*Sambucus* sp.), a common shrub of riparian forests and adjacent upland habitats in California's Central Valley (Barr 1991; USFWS 1999; USFWS 2006b). Females lay their eggs

[12] Elytra are thickened, horny, or leathery anterior wings that serve to protect the posterior pair of functional wings.

on the bark, and the larvae hatch and burrow into the stems and feed on the pith. The larval stage may last from 1 to 2 years. Prior to pupation, the final larval instar[13] emerges from the shrub stem to chew through and create a hole in the inner bark and then returns to the plant stem to pupate (Collinge et al. 2001). When the adult valley elderberry longhorn beetle is ready to emerge, the beetle moves through the previously created hole, chews through the remaining outer bark, and emerges through a circular or slightly oval exit hole (0.16 to 0.40 inch in diameter) between March and mid-May, corresponding to the time the elderberry produces flowers (Collinge et al. 2001). Adults live only for a number of days to a few weeks, mating and feeding on the leaves, flowers, and nectar of the elderberry (Collinge et al. 2001).

Valley elderberry longhorn beetle larvae and adults are extremely cryptic and presence of the beetle on the host plant is not readily apparent (Talley et al. 2007). Often, the only external evidence of the shrub's use by the beetle is an exit hole (Barr 1991). No other species in the Central Valley is known to inhabit live elderberry and make exit holes of similar shape and size (Barr 1991).

Dispersal ability is thought to be very limited in valley elderberry longhorn beetle, with Talley et al. (2007) suggesting that adults move less than 164 feet (50 meters) from the sites at which they emerge. Similarly, Collinge et al. (2001) found that within-drainage turnover was relatively high, while between-drainage turnover was rare, again suggesting that dispersal ability is limited. It was also reported that valley elderberry longhorn beetles tend to occur in population clusters and typically are not evenly distributed over all available elderberry plants. Valley elderberry longhorn beetle exit holes were most often found on branches measuring 2 to 4 inches in diameter and were typically found on branches less than 3 feet from the ground (Collinge et al. 2001). Population densities of valley elderberry longhorn beetle are quite low. As adult valley elderberry longhorn beetles are rarely observed, density has to be estimated using exit holes on elderberry shrubs (Talley et. al. 2006b). The number of exit holes created by the beetle in any given year is low and ranges from 2.2 to 2.9 holes per shrub in riparian habitat (Talley et al. 2007).

Distribution and Population Trends

The valley elderberry longhorn beetle is endemic to the Central Valley of California, where it occurs only in association with red elderberry and blue elderberry (Barr 1991; Collinge et al. 2001). The elderberry tree is associated with riparian forests that occur along rivers and streams in the Central Valley. Historically, valley elderberry longhorn beetle was believed to have been restricted to an area of approximately 186 by 62 miles (300 by 100 kilometers) in the lower Sacramento and upper San Joaquin Valleys (Collinge et al. 2001). At the time of its listing in 1980, valley elderberry longhorn beetle was known from less than 10 locations (USFWS 2007b), while at present there are approximately 190 records for valley elderberry longhorn beetle. The

[13] An instar is a stage of an insect between successive molts.

proliferation in the number of records is primarily due to increased survey efforts (USFWS 2006b). Based on Barr's (1991) survey, the only surviving valley elderberry longhorn beetle populations occur in isolated and scattered localities from Redding in Shasta County south to the Bakersfield area. Nevertheless, the most recent Five-Year Status Review of the valley elderberry longhorn beetle recommended delisting the beetle on the basis of recovery, citing the expansion of the species noted above and the expansion of protected areas containing elderberry habitat (USFWS 2006b).

Reasons for Decline

The main threats to survival of the beetle include: (1) loss and alteration of habitat by agricultural conversion; (2) over-grazing; (3) levee construction, stream and river channelization, removal of riparian vegetation, and riprapping of shoreline; (4) nonnative animals, such as the Argentine ant (*Linepithema humile*), which may eat the early phases of the beetle; and (5) recreational, industrial, and urban development (Talley et al. 2006a; USFWS 2006b; Talley et al. 2007). The limited geographic range, high habitat specificity, limited dispersal ability, and small local populations of this species make it especially vulnerable to extinction by stochastic events (Talley et al. 2006b).

Due to expanding agricultural conversion, increased residential and commercial development, levee construction for flood control, dam construction, heavy groundwater pumping, water diversion, and stream channelization, extensive destruction of California's Central Valley riparian forests has occurred during the last 150 years, with an estimated 90% reduction in riparian forest cover during that time period (USFWS 1984c; Collinge et al. 2001). The alteration and fragmentation of such riparian habitats and adjacent upland habitats, which support the beetle, have led to a serious decline in valley elderberry longhorn beetle populations (USFWS 2006b).

Insecticide, broad-spectrum pesticide, and herbicide use in agricultural areas and along road right-of-ways may be factors limiting the beetle's distribution. The greatest pesticide use in the state occurs in the San Joaquin Valley, which includes much of the range of valley elderberry longhorn beetle (USFWS 2006b). Given the significant pesticide use associated with agricultural activities and the proximity of agriculture to riparian habitats in the Central Valley, it appears likely that pesticides may be negatively impacting valley elderberry longhorn beetle and its associated habitat (USFWS 2006b).

Over-grazing by cattle and deer, which readily forage on elderberry, also may negatively impact valley elderberry longhorn beetle populations (USFWS 1984c). As valley elderberry longhorn beetles are more common in denser, mature stands of elderberry, over-grazing and thinning of these stands could lead to a decrease in the number of valley elderberry longhorn beetles, while direct grazing damage to the elderberry plants could be destructive to the larval and pupal stages of the species (Barr 1991).

A number of non-native plants, such as giant reed, tamarisk, and black locust (*Robinia pseudoacacia*), are displacing native vegetation in riparian habitats in California, including displacing elderberry species, which could lead to a reduction in valley elderberry longhorn beetle (Talley et al. 2007).

The Argentine ant may also negatively influence populations of the valley elderberry longhorn beetle. The Argentine ant is an aggressive competitor and predator of native fauna and may interfere with valley elderberry longhorn beetle mating behavior or prey on valley elderberry longhorn beetle eggs and larvae (USFWS 2006b). The European earwig (*Forficula auricularia*), a potential predator of valley elderberry longhorn beetle, is common in riparian areas and may also negatively impact valley elderberry longhorn beetle populations (USFWS 2006b).

The Recovery Plan for valley elderberry longhorn beetle identifies a number of actions that could aid in the recovery of the species (USFWS 1984c). These actions include minimizing the use of pesticides, insecticides, herbicides, and other toxic substances; removing exotic plants from riparian areas; minimizing activities that are not compatible with the maintenance of riparian habitat; developing management plans for the species; and conducting studies to determine the life history and ecological requirements of valley elderberry longhorn beetle in order to reduce threats to and manage for the species.

5.2.3.1.2 HABITAT CHARACTERISTICS AND USE

All life stages of the valley elderberry longhorn beetle (except dispersal) occur on its host plant, elderberry (Barr 1991; Talley et al. 2007). Elderberry trees and shrubs with valley elderberry longhorn beetle populations occur in a variety of habitat types, but most frequently in riparian or elderberry savannah habitats (Barr 1991). Two species of elderberry serve as host for the beetle: blue elderberry (*Sambucus mexicana*) and red elderberry (*S. racemosa* var. *microbotrys*) (Talley et al. 2007). Elderberry grows in association with a number of woody plants, including Fremont cottonwood, western sycamore, willow, oak (*Quercus* spp.), box elder (*Acer negundo*), Oregon ash (*Fraxinus latifolia*), wild grape (*Vitis californica*), and poison oak (*Rhus diversiloba*) (Barr 1991; Collinge et al. 2001).

Valley elderberry longhorn beetle signs have been recorded on all ages, sizes, and growth forms of elderberry, but exit holes are more frequently recorded in older, larger, and healthier plants (Collinge et al. 2001). Barr (1991) also reported that valley elderberry longhorn beetles were more likely to occur in areas where individual elderberry plants were in close proximity to each other (Collinge et al. 2001). Plants showing signs of valley elderberry longhorn beetle presence usually show evidence of utilization for a number of years (Barr 1991).

5.2.3.1.3 OCCURRENCE IN THE COVERED LANDS

Surveys for valley elderberry longhorn beetle were conducted in the TMV Planning Area in accordance with the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999). All areas at elevations less than 3,500 feet amsl (an elevation level approximately 500 feet higher than recorded for the species) within the TMV Project's development envelope and within a 100-foot buffer of the development envelope were surveyed in accordance with the USFWS guidelines (USFWS 1999). See *Appendix D.1* for more detailed information on survey methods.

All elderberry plants within the general survey area were mapped using a GPS receiver. The elderberry shrub surveys were conducted by Dudek urban foresters and/or arborists April 23 through 27, April 30, and May 1 through 3, 2007. Survey results were negative for presence of valley elderberry longhorn beetle. In addition, there are no CNDDB occurrences for the species on Covered Lands (CDFG 2011a).

Suitable habitat for the species was modeled for all Covered Lands (see *Appendix D* for habitat modeling methods). Because the available vegetation mapping does not include an elderberry mapping unit, general vegetation communities associated with elderberry occurrence were used in the model. Modeled suitable habitats on Covered Lands are conifers, savannah, and woodlands within 300 feet of blue-line streams at elevations between 1,900 and 3,000 feet amsl.

Modeled suitable habitat within Covered Lands for valley elderberry longhorn beetle is shown in *Figure 5-18*, *Valley Elderberry Longhorn Beetle Modeled Suitable Habitat*. A total of 2,597 acres of suitable habitat for valley elderberry longhorn beetle was modeled for Covered Lands. However, the potential for valley elderberry longhorn beetle to occur on Covered Lands is low because of negative survey results and because the majority of Covered Lands are above the elevational range of this species and at the extreme southern edge of the species' geographical range. In addition, because it is unlikely that all modeled suitable habitat would be saturated, and because it is assumed that some modeled suitable habitat may not contain the microhabitat (i.e., elderberry shrubs/trees) required by this species, not all modeled suitable habitat is expected to be occupied by this species.

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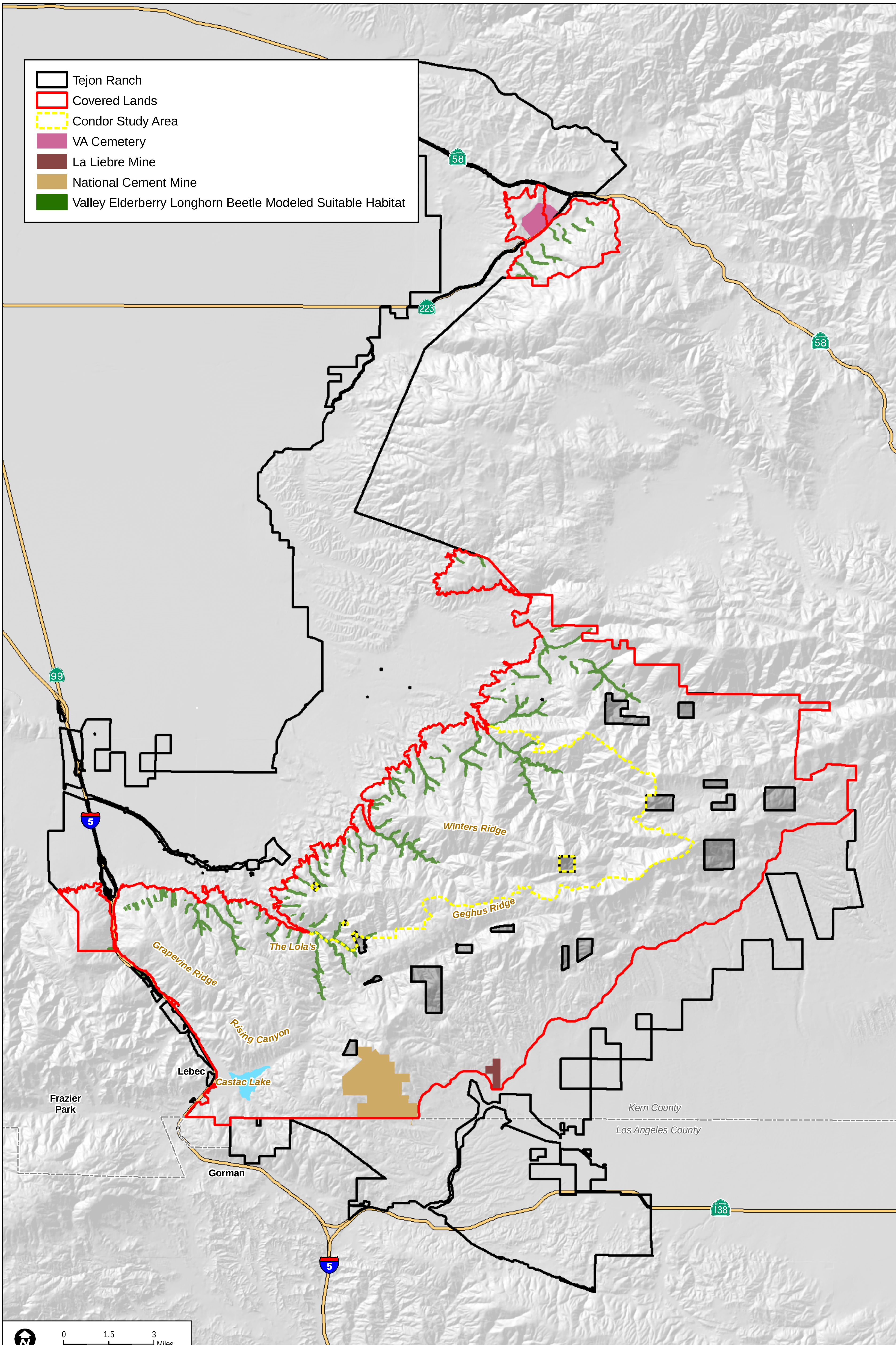

SOURCE: TRC 2007

FIGURE 5-18

Valley Elderberry Longhorn Beetle Modeled Suitable Habitat

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5.2.4 MAMMALS

5.2.4.1 RINGTAIL

The ringtail (*Bassariscus astutus*) is dark brown to buff in color, with white fur on its underside. The ringtail is smaller than a house cat, measuring 12 to 17 inches long, with a tail of 12 to 17 inches, and weighing 1.8 to 3.3 pounds (Nowak 2005). A key characteristic is its striped black-and-white tail that resembles a raccoon's tail and is longer than the rest of its body. The tail is banded with 14 to 16 alternating black-and-white rings (black rings are incomplete on its underside), with a black tip (Davis and Schmidly 2007). The eyes are large and black, each surrounded by a patch of light fur (Hall 1981).

There are 14 recognized subspecies of ringtail, including *B. a. octavus* that occurs through the Tehachapi Mountains and Central Coast area, south along the coastal regions of Southern California to the border with Baja California, Mexico (Hall 1981); and *B. a. raptor* that occurs along the western slope of the Sierra Nevada and the Pacific drainage slope from the Oregon border to Ventura County, where it intergrades with *B. a. octavus* (Belluomini 1980).

5.2.4.1.1 STATUS AND DISTRIBUTION

Regulatory History

The ringtail, a nocturnal mammal belonging to the raccoon family, has no Federal designation, but is a Fully Protected species in California, a designation that provides additional protection to animals that are rare and facing possible extinction (CDFG 2011a).

Natural History

Ringtail home ranges are widely variable and are related to sex and habitat factors (Poglayen-Neuwall and Toweill 1988). However, the observed variation in home ranges also may be related to field and estimation methods (Poglayen-Neuwall and Toweill 1988). Based on radiotelemetry data, for example, ringtail home ranges in an oak woodland habitat in Texas were on average 106 acres (43 hectares) for males and 49 acres (20 hectares) for females, measured over a 15-month period (Lindstedt et al. 1986; Poglayen-Neuwall and Toweill 1988). In contrast, home ranges in a riparian habitat averaged 12 to 34 acres (5 to 14 hectares) measured over an 8-month period and 336 acres (136 hectares) in canyon lands in Zion National Park, measured over a 1- to 2-month period (Poglayen-Neuwall and Toweill 1988). Male–female (intersexual) home ranges overlap but there has been no observed male–male or female–female (intrasexual) home range overlap (Poglayen-Neuwall and Toweill 1988). Outside of breeding periods, males and females generally are solitary in the wild (Poglayen-Neuwall and Toweill 1988).

Ringtails are primarily nocturnal but also exhibit crepuscular activity patterns at dawn and dusk (Kavanau 1971). They are omnivorous and also display seasonal variation in their diet, depending on food availability. They primarily eat rodents (woodrats, mice, and squirrels), rabbits, hares, carrion, and arthropods (*Orthoptera*, *Coleoptera*, and *Lepidoptera*), but may also take birds (usually small passerines), snakes, frogs, fish (Poglayen-Neuwall and Toweill 1988), berries, and fruits (Belluomini 1980). Ringtails forage on the ground, among rocks and in trees, usually near water (Poglayen-Neuwall and Toweill 1988).

The ringtail breeding season is from February into May, with the peak of activity in March and April (Poglayen-Neuwall and Toweill 1988). The gestation period is 51 to 54 days, with births occurring in May and June. Litter size typically is one to four, with five having been reported (Poglayen-Neuwall and Toweill 1988). Although young are born relatively undeveloped (altricial), they develop rapidly and are climbing by 8 weeks and attain adult size by 30 weeks (Poglayen-Neuwall and Toweill 1988). They usually reach sexual maturity by the end of their second year, but breeding by young of the-\ year has been documented (Poglayen-Neuwall and Toweill 1988). Ringtails usually live 12 to 14 years, with a maximum known lifespan of 16.5 years (Poglayen-Neuwall and Toweill 1988).

Natural predators of ringtails include bobcat, raccoon, fox, and large owls, and they likely compete for food with raccoon, gray fox, and coyote, as well as owls and large snakes (Zeiner et al. 1990c).

Distribution and Population Trends

The ringtail is found in the southwestern United States, in the states of Oregon, California, Nevada, Utah, Colorado, Kansas, Arizona, New Mexico, Oklahoma, and Texas. The ringtail is widely distributed in California where it is a locally common to uncommon permanent resident (CDFG 2005).

The current distribution of ringtails in parts of California was described by Grinnell et al. (1937) but has since been expanded to include most of California with the exception of the extreme northeast corner of the state and southern portions of the San Joaquin Valley. Orloff (1988) extended the range of the ringtail to include the Mojave and Colorado Deserts, Sacramento Valley, northern portions of the San Joaquin Valley, northern Mono County, the high Sierra Nevada south of Lake Tahoe, and northeastern portions of the state. Occurrence reports described by Orloff (1988) suggest that ringtails are most abundant along riparian areas in Northern California and the Sierra Nevada foothills. A detailed study of mammalian carnivores weighing less than 44 pounds analyzed the distribution of ringtail in the forested regions of the Sierra Nevada and Cascade Ranges, and determined that the ringtail occurred as far south as the Sierra Nevada in Kern County (Zielinski et al. 2005).

Belluomini (1980) conducted a review of the ringtail in California based on sighting records, museum specimens, and the current scientific literature, resulting in 446 occurrence records in 49 counties in California. The species was absent only from Modoc Plateau, Antelope Valley, and portions of the San Joaquin Valley. Abundance was highest along riparian areas in Northern California and most scarce in the Mojave and Colorado Deserts, the east slope of the Sierra Nevada, the San Joaquin Valley, and northeastern California (Belluomini 1980).

Ringtails are generally uncommon and are distributed sporadically, occurring in varying population densities where they do occur. In two California locales, densities ranged from 27 to 53 ringtails per square mile in the northern Central Valley, but only from 0.2 to 6 ringtails per square mile in chaparral in a Pacific drainage of the Sierra Nevada (Grinnell et al. 1937). Elsewhere, population densities have ranged from four to seven ringtails per square mile in Zion National Park in Utah and from six to 11 ringtails per square mile in juniper and oak woodland habitat on the Edwards Plateau in Texas (Poglayen-Neuwall and Toweill 1988).

The Covered Lands are located in an area where two subspecies of ringtail, *B. a. octavus* and *B. a. raptor*, intergrade. The northern limit of the range of *B. a. octavus* and the southern limit of the range of *B. a. raptor* are in close proximity to the Covered Lands. Belluomini (1980) concluded that both of these species have undergone range expansions since the earlier study of ringtail density in California by Grinnell et al. (1937).

Reasons for Decline

There is very little information available to directly assess the threats to ringtails. However, the close association of ringtails to riparian habitats, combined with the extensive loss and fragmentation of such habitats throughout its range over the last 150 years through urbanization and agricultural conversion, would suggest that the population size of ringtails has declined. Elsewhere, ringtails are or have been harvested extensively as furbearers or are taken in traps set for other furbearing species (Poglayen-Neuwall and Toweill 1988).

A potential threat related to habitat loss and fragmentation is a decline in coyote population numbers in fragmented habitats, resulting in the "mesopredator release" effect (Crooks and Soulé 1999). Crooks and Soulé (1999) suggested that declines in coyote population numbers contributed to an increased abundance of mesopredators, including raccoon and fox, which are potential predators on ringtails (Zeiner et al. 1990c). A rise in raccoon numbers could increase competition for food. Other urban-related potential threats are nighttime lighting, which could make ringtails more vulnerable to nocturnal predators such as owls, raccoons, and foxes; increased human activity within or in proximity to ringtail habitat (e.g., increased stress, harassment, disturbance of dens, trampling of vegetation, off-road vehicles); pet, stray, and feral cats and dogs; and rodenticides that could reduce the rodent prey of ringtails.

5.2.4.1.2 HABITAT CHARACTERISTICS AND USE

Ringtails live in a variety of habitats within their range, but have a strong preference for rocky areas such as rock piles, stone fences, canyon walls, and talus slopes (Davis and Schmidly 2007).

According to CDFG (2005), suitable habitat for ringtails consists of various riparian habitats, due to increased availability of food supply, and a mixture of forest and shrubland in close proximity to rocky areas and water resources. According to Poglayen-Neuwall and Toweill (1988), ringtails can be found in semi-arid country, deserts, chaparral, oak woodlands, pinyon pine woodlands, juniper woodlands, and montane conifer forests. However, ringtails are rarely found further than 0.6 mile (1 kilometer) from permanent water (CDFG 2005). Ringtails can be found at elevations of up to 9,500 feet (2,900 meters) but are most common at elevations ranging from sea level to 4,600 feet amsl (1,400 meters) (Poglayen-Neuwall and Toweill 1988).

Ringtails use hollow trees, logs, snags, cavities in talus, and other rocky areas as cover and establish nests in rock recesses, hollow trees, logs, snags, abandoned burrows, or woodrat nests (CDFG 2005). They are expert climbers, capable of ascending vertical walls (Davis and Schmidly 2007).

5.2.4.1.3 OCCURRENCE IN THE COVERED LANDS

A focused survey for ringtail was conducted in the TMV Planning Area in 2007 by Dudek (Dudek 2009). The focused survey methods were developed based on a review of the scientific literature regarding ringtail habitat preferences and behavior and previously employed survey and trapping methods. Based on this, it was determined that baited camera stations and sooted plates located within suitable habitat were the most effective and reliable method for detecting the presence of the ringtail. Camera stations were placed along perennial or longer-lasting intermittent streams, at other permanent water sources (e.g., cattle guzzlers, springs), and at Castac Lake at approximately 0.25-kilometer intervals (820 feet) and at the distal ends of linear watercourses and adjacent to springs or other point-source water sources throughout the TMV Planning Area (Dudek 2009). Where multiple point sources (e.g., cattle guzzlers or springs) occurred near each other (not more than 0.25 kilometer from each other), a single camera station was placed near the center of these locations. Camera stations included one digital Cuddeback camera with a 512-megabyte CompactFlash card and an opposing bait station. Cameras were maintained in place for a period of 16 consecutive days. The cameras were deployed in 14 sessions at approximately 191 camera stations throughout the site and at 29 locations outside the project boundary. Approximately 18 camera stations were used for each of the 14 camera sessions. The survey began in February 2007 and was completed in November 2007. See *Appendix D.1* for more detailed information on survey methods.

Potential ringtail scat was reported from the TMV Planning Area in 2006 (Dudek 2009), but no photographs, samples, or descriptions were provided, so this potential observation of ringtail is unconfirmed. Other studies have not observed the ringtail but considered the site to have high potential to support the species (Compliance Biology 2003; Jones and Stokes 2006a). Jones and Stokes (2006a) also cite a personal communication with Antone Mattias, a TRC ranger, stating that ringtail is present on Tejon Ranch, but specific detail regarding the location or evidence of occupation is not provided in the personal communication cited by Jones and Stokes. No ringtail individuals were documented in the TMV Planning Area during the extensive focused survey in 2007 (Dudek 2009). Ringtails appear to be absent from the TMV Planning Area despite the availability of suitable habitat, and if they do occur, the population is likely to be very small. Based on the negative results from the TMV Planning Area surveys, the species may be absent from Covered Lands, or if present, likely to occur in low population densities.

Suitable habitat for the ringtail was modeled on Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitat on Covered Lands includes riparian woodland, riparian scrub, riparian/wetland, wetland, lake, wash, seeps, springs, and perennial streams, as well as all vegetation within 1 kilometer (approximately 3,274 feet) of the edge of these communities.

Modeled suitable habitat within Covered Lands for ringtail is shown in *Figure 5-19, Ringtail Modeled Suitable Habitat*. A total of 99,253 acres of suitable habitat for ringtail was modeled for Covered Lands. However, because of the negative survey results within the TMV Planning Area, the potential for this species to occur within Covered Lands is expected to be very low. In addition, because it is unlikely that all modeled suitable habitat would be saturated, and because it is assumed that some modeled suitable habitat may not contain the microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species. Taken together, the suitable habitat model and TMV Planning Area survey data indicate that the model may be too general to predict presence of ringtail on Covered Lands.

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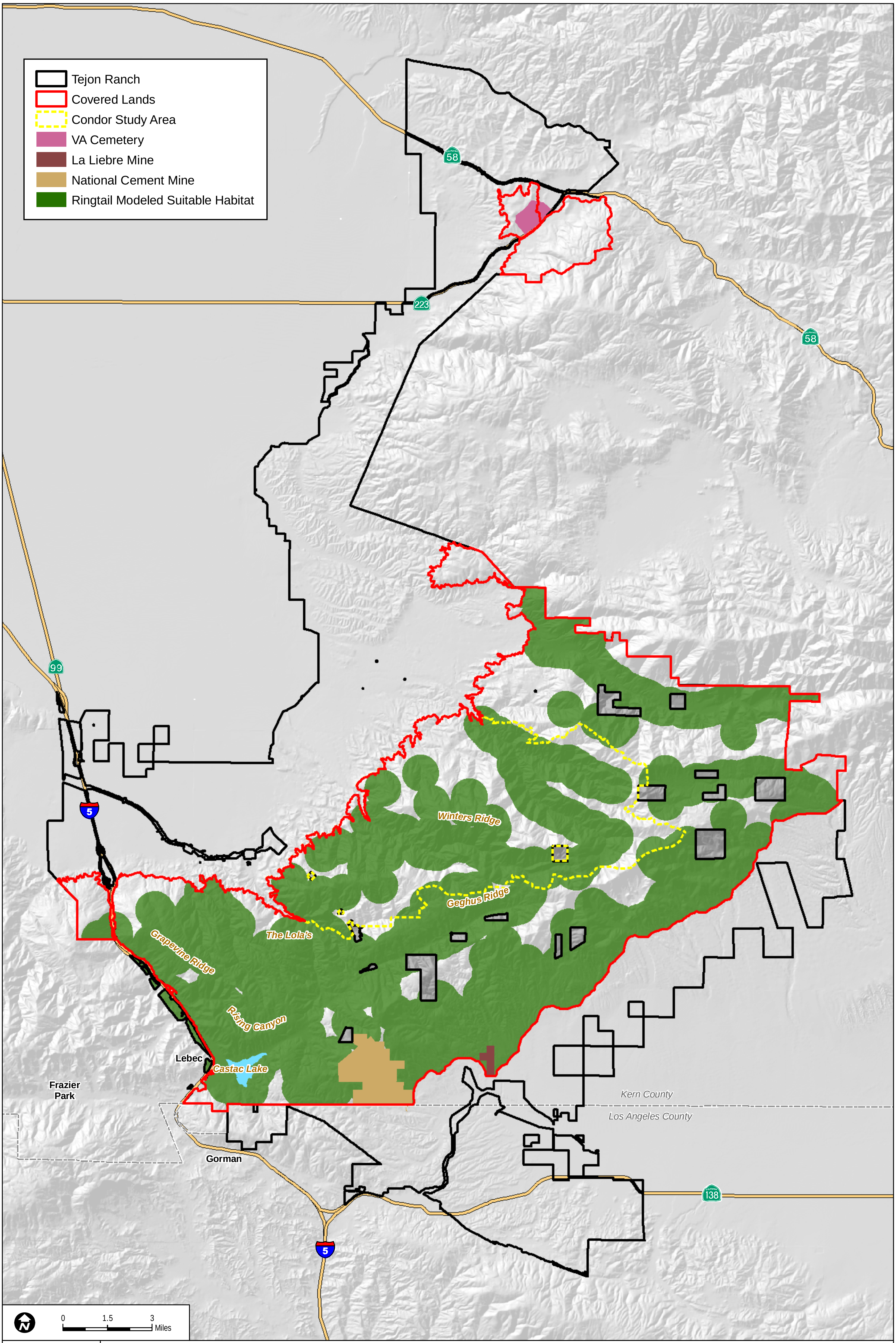

SOURCE: TRC 2007

FIGURE 5-19

Ringtail Modeled Suitable Habitat

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5.2.4.2 TEHACHAPI POCKET MOUSE

Tehachapi pocket mouse (*Perognathus alticola inexpectatus*), also called Tehachapi white-eared pocket mouse, is one of two subspecies of white-eared pocket mouse currently recognized (Hall 1981). The white-eared pocket mouse (and its subspecies) is closely related to, and possibly only subspecifically distinct from, the Great Basin pocket mouse (*P. parvus*) (Williams et al. 1993). Tehachapi pocket mouse and white-eared pocket mouse (*P. alticola alticola*) occupy geographically distinct ranges; it has also been theorized that the two are specifically distinct (Williams et al. 1993). In addition to having a geographical disjunct range, Tehachapi pocket mouse can be distinguished from the white-eared pocket mouse by its larger size; darker, more pointed ears; and square pentagonal interparietal bone (Best 1994; Laabs 2008; Williams et al. 1993).

Tehachapi pocket mouse is a relatively large pocket mouse species (averaging 5.9 to 6.5 inches in length for females and males, respectively) with a long tail (2.4 to 3.8 inches) and weight of 0.56 to 0.85 ounces (Hall 1981; Best 1994). Tehachapi pocket mouse exhibits sexual dimorphism, with males significantly larger than females in total length, length of body, length of tail, and length of hind foot (Best 1994). It is pale orange, lightly patterned with gray dorsally and white ventrally, with a narrow to broad pale orange lateral line of varying width on both sides. The earlobe has a small white spot at the base (Reid 2006). The tail is tricolored with a black or dusky tip that extends dorsally for at least half the length of the tail (Best 1994).

5.2.4.2.1 STATUS AND DISTRIBUTION

Regulatory History

The Tehachapi pocket mouse is a subspecies of the white-eared pocket mouse (*Perognathus alticola*) and is a CDFG Species of Special Concern (CDFG 2011a).

Natural History

There is little information available on the life history of Tehachapi pocket mouse; therefore, much of the life history reported below is of the white-eared pocket mouse and the Great Basin pocket mouse, two other members of the species group, which the literature assumes have similar life histories (CDFG 2005; Laabs 2008). Other members belonging to Tehachapi pocket mouse species group are nocturnal granivores that feed on a variety of grass seeds but may also feed on leafy plant material and prey on insects (Verts and Kirkland 1988; CDFG 2005) by foraging on open ground and under shrubs (CDFG 2005). Other members of this species group are thought to aestivate during very hot weather and hibernate in cold weather, with burrows constructed in loose, friable soils (CDFG 2005; Laabs 2008). The reproductive period of the related species, Great Basin pocket mouse, is from March to August (CDFG 2005). Gestation is likely to last 21 to 28 days, with litter size ranging from three to eight pups (CDFG 2005). The young are likely to be weaned within 3 weeks (CDFG 2005). Predators include foxes, coyotes, weasels, owls, and snakes (CDFG 2005).

The home range size of the closely related Great Basin pocket mouse has been reported as 0.16 to 0.22 acre in British Columbia, with males having larger home ranges than females (Howard 1996). Average home range size of Great Basin pocket mouse from south–central Washington was reported as 0.53 to 0.78 acre (Howard 1996). It has also been observed that the home ranges of reproductively active males are larger than non-reproductively active males (Howard 1996).

Distribution and Population Trends

The Tehachapi pocket mouse is known from a few scattered localities in the Tehachapi Mountains, from Tehachapi Pass on the northeast to the area of Mt. Pinos on the southwest, and around Elizabeth, Hughes, and Quail Lakes on the southeast. It has been recorded between 3,500 and 6,000 feet amsl in elevation. The Tehachapi pocket mouse is considered very rare and is in danger of extinction (CDFG 2005; Jameson and Peeters 2004). A survey of a number of historical Tehachapi pocket mouse locations in the 1980s failed to record any Tehachapi pocket mouse individuals (Laabs 2008). More recent mammal surveys on Tejon Ranch resulted in capture of five individual Tehachapi pocket mice in live traps in and adjacent to the southeastern portion of the Covered Lands within the Bi-Centennial and Tri-Centennial conservation easement areas. A Tehachapi pocket mouse was also captured in Bronco Canyon in the Bi-Centennial area in 2001 and just west of the Bi-Centennial area in 2003. Also, this species was recently documented on Covered Land; see Section 5.2.4.2.3 for results of surveys on the Covered Lands.

Reasons for Decline

Habitat fragmentation and isolation, caused by increased urbanization and agricultural intensification, appear to be the major threats to this species. As the species occurs in isolated, scattered populations, any natural or human-related event that exacerbates the isolation of these populations is a serious and immediate threat to this species, making it vulnerable to local extirpation. Any type of surface disturbance could be a threat to the Tehachapi pocket mouse. Over-grazing by livestock could be a threat to the species by resulting in a reduction in dense shrub cover within its preferred habitat and a reduction in plant diversity and abundance.

Other threat factors that are associated with urban development include an increase in the abundance of urban-related predators, such as pet, stray, and feral cats and dogs; nighttime lighting that could make Tehachapi pocket mouse more vulnerable to nocturnal predators such as owls, raccoons, and foxes; increased human activity resulting in habitat degradation (e.g., trampling of vegetation, introduction of exotic species, and off-road vehicles); and the use of rodenticides.

5.2.4.2.2 HABITAT CHARACTERISTICS AND USE

Tehachapi pocket mouse is known to occur in grasslands (both native and non-native), Joshua tree woodland, pinyon-juniper woodland, yellow pine woodland, and oak savannah (Williams et al. 1993). The five individuals that were captured in the Bi-Centennial and Tri-Centennial conservation easement areas in 2010 were all found in arid shrub communities on slopes. It has been recorded at higher elevations in open pine forests (Huey 1926) and at lower elevations in chaparral and coastal sage communities (Best 1994). It has also been detected in fallow fields dominated by Russian thistle (Zeiner et al. 1990c). It constructs burrows in loose, sandy soils (Zeiner et al. 1990c). Elevations range between 3,500 and 6,000 feet amsl.

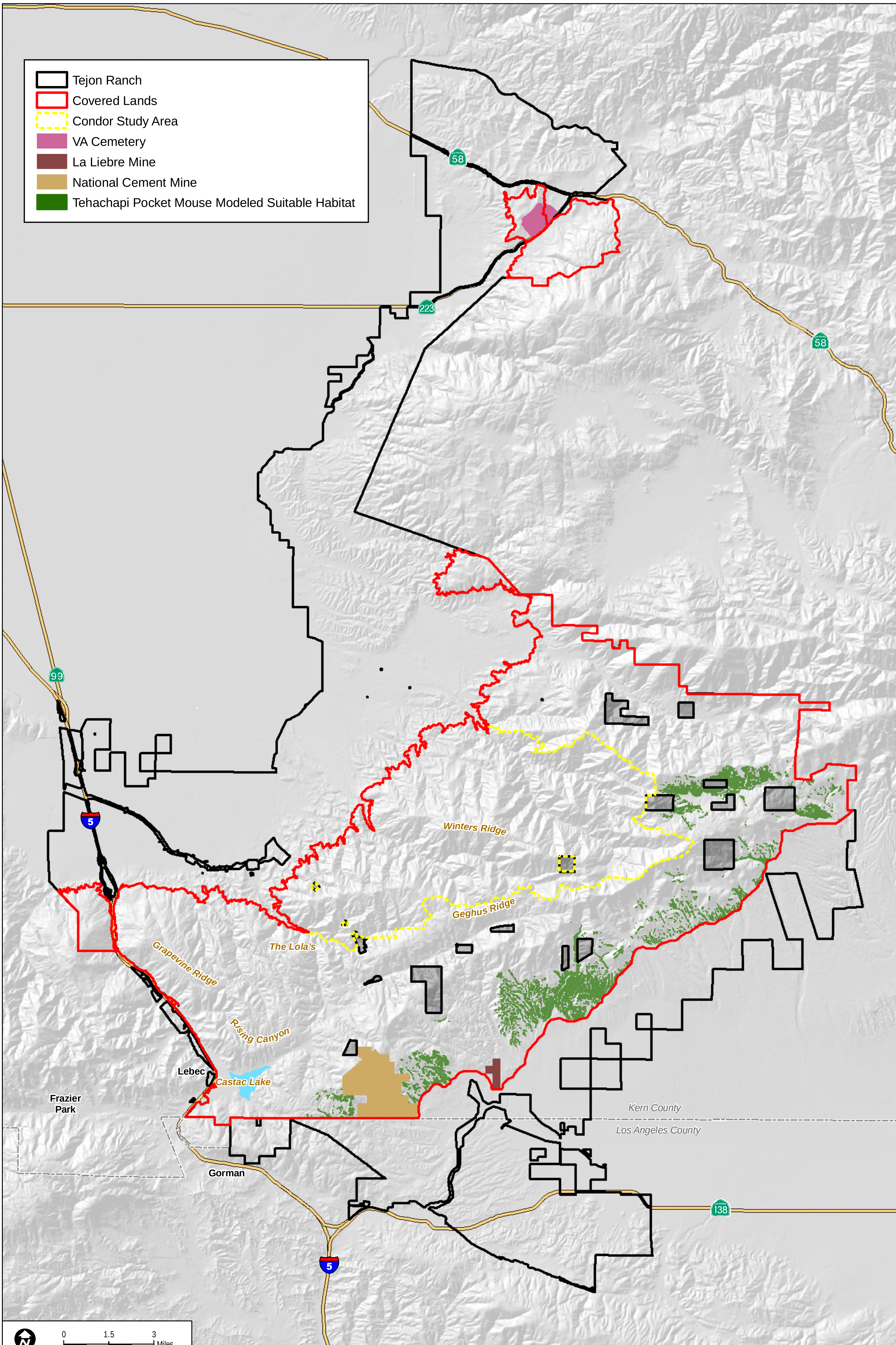
5.2.4.2.3 OCCURRENCE IN THE COVERED LANDS

Focused small mammal trapping, including for Tehachapi pocket mouse, was conducted by Compliance Biology in 2003 over an approximately 4,500-acre portion of the TMV Planning Area (Compliance Biology 2003) and at additional locations in 2007 (Jones and Stokes 2008a). Focused trapping surveys were conducted in representative suitable/potential habitat within the TMV Planning Area. Tehachapi pocket mouse was detected in the southeastern portion of the TMV Planning Area between Oso and Dark Canyons near the southern border of the TMV Planning Area during various surveys. These occurrences were in non-native grasslands and open oak woodlands adjacent to scrub communities and coniferous/oak communities, specifically those with a California juniper component. All of the occurrences in the TMV Planning Area are within the Antelope–Fremont Valley watershed, and focused studies seem to indicate that this is the northerly limit of the species' range. The ridgeline above the Antelope–Fremont Valley watershed occurrences, along with apparently unsuitable habitats, appears to pose significant obstacles to expansion of range. Therefore, Tehachapi pocket mouse is not expected to occur north of this watershed boundary. See *Appendix D.1* for more detailed information on survey methods.

The CNDDB reports three occurrences of Tehachapi pocket mouse in the TMV Planning Area, all along the southern edge of the site. CNDDB occurrences are found in grasslands, desert wash/riparian/seeps, and open woodlands (CDFG 2011a). As noted above, mammal trapping in 2010 capture five individual pocket mice in and adjacent to the southeastern portion of the Covered Lands.

Suitable habitat for the Tehachapi pocket mouse was modeled for all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitats on Covered Lands are conifer, savannah, scrub, and woodland between 3,500 and 6,000 feet amsl within the Antelope–Fremont Valley watershed and on slopes of less than 15% grade.

Modeled suitable habitat within Covered Lands for Tehachapi pocket mouse is shown in *Figure 5-20, Tehachapi Pocket Mouse Modeled Suitable Habitat*. A total of 1,931 acres of suitable habitat for Tehachapi pocket mouse was modeled for Covered Lands. However, because it is unlikely that all modeled suitable habitat would be saturated, and because it is assumed that some modeled suitable habitat may not contain the microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species.



SOURCE: TRC 2007

FIGURE 5-20

Tehachapi Pocket Mouse Modeled Suitable Habitat

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5.2.5 REPTILES

5.2.5.1 COAST HORNED LIZARD

The coast horned lizard (*Phrynosoma blainvillii*) is a flat-bodied lizard with a wide oval-shaped body; scattered enlarged pointed scales on the upper body and tail; a large crown of horns or spines on the head, four of which are large and sometimes curved; and one medium-sized spine (Jennings and Hayes 1994). The dorsal color is highly variable but typically is reddish, brown, yellow, or gray, with dark blotches on the back and large dark spots on the sides of the neck, while the ventral side is cream, beige, or yellow, usually with dusky spots, and the belly scales are smooth (Jennings and Hayes 1994).

5.2.5.1.1 STATUS AND DISTRIBUTION

Regulatory History

The coast horned lizard does not have any Federal designations. The coast horned lizard is designated a CDFG California Species of Special Concern (CDFG 2011a).

Natural History

Up to 90% of the diet of the coast horned lizard consists of native harvester ants (*Pogonomyrmex* spp.) (Pianka and Parker 1975), and coast horned lizards do not appear to eat non-native Argentine ants (Jennings and Hayes 1994). Other slow moving insects, such as beetles, flies, and caterpillars, are consumed opportunistically when encountered (Presch 1969; Pianka and Parker 1975). Whitford and Bryant (1979) found that the coast horned lizards feed most often on ants that were not associated with nest discs or foraging columns and took only a few ants at any one place. Hatchlings were found to feed exclusively on the native ants *P. rugosus* and *P. desertorum*, taking an average of three harvester ants per bout and retreating to the shelter of a low shrub or grass where they remained for about 20 to 30 minutes before feeding again.

Coast horned lizards emerge from hibernation in March, and become surface active in April through July, after which most adults aestivate (summer hibernation) (Hagar 1992). The adults reappear again briefly in late summer and return to overwintering sites between August and early October depending upon elevation (Klauber 1939; Howard 1974; Hagar 1992).

The daily diurnal activity of coast horned lizards is tied closely to surface temperatures. As surface temperatures reach at least 19°C (66°F) just prior to sunrise, lizards emerge from burial sites in the substrate into a position that allows them to bask in the first rays of the sun (Heath 1965; Hagar 1992). Although horned lizards emerge at relatively low temperatures, the optimum temperature range for horned lizard activity is 29°C to 39°C (84°F to 102°F). Midday temperatures over 40°C (104°F) are avoided as horned lizards cover themselves with loose soil by literally swimming into the substrate (Stebbins 1954). In the later afternoon, individuals re-emerge from the substrate and resume full activity (Jennings and Hayes 1994). Coast horned lizards often display high site-fidelity because effective temperature regulation requires familiarity with their surroundings (Heath 1965).

In Southern California, the male coast horned lizard reproductive cycle begins during mid- to late March and ends in June (Goldberg 1983). Coast horned lizards lay one clutch of six to 17 eggs (average of 11 to 12 eggs) each year from May through early July (Stebbins 1954; Howard 1974; Goldberg 1983). Incubation requires approximately 2 months and hatchlings first appear in late July and early August (Shaw 1952; Howard 1974; Hagar 1992). Male and female coast horned lizards require 2 to 3 years to reach sexual maturity (Stebbins 1954; Howard 1974; Pianka and Parker 1975; Goldberg 1983). Data on longevity in the wild are lacking, but adults are thought to be relatively long-lived (i.e., greater than 8 years) (Baur 1986).

There are no movement and dispersal data specifically for the coast horned lizard, but horned lizards as a group show limited home ranges, usually less than 5 acres (Munger 1984). Whitford and Bryant (1979) recorded daily movements of the closely related *Phrynosoma cornutum* to be an average of only 153.5 feet per day (range = 29.5 to 298.5 feet). Whitford and Bryant (1979) also found that an individual horned lizard moved over a zigzag course during a day but rarely crossed its own trail. Radiotelemetry of several dozen coast horned lizards in Southern California locations over a 5-year period documented annual home range sizes of about 3 to 3.5 acres, with the likelihood that, across years, home range areas could be larger (Suarez, pers. comm. 2005).

Distribution and Population Trends

The coast horned lizard is broadly distributed in California and occurs in the foothills of the Sierra Nevada from Butte County to Kern County and throughout most of coastal central and Southern California in locations west of the desert and Cascade–Sierran highlands, in elevations from sea level to around 2,438 meters (8,000 feet) amsl (Stebbins 2003; Zeiner et al. 1988). It also occurs throughout Baja California, Mexico. Historically, coast horned lizard has been found along the Pacific coast from Baja California west of the deserts and the Sierra Nevada, north into the Bay Area, and inland as far north as Shasta Reservoir (CaliforniaHerps 2011).

Despite a wide-ranging distribution, the coast horned lizard seems to be restricted to localized populations because of its association with loose soils that have a high sand content (Jennings and Hayes 1994). No population estimates are available, but the coast horned lizard may be declining as a result of habitat loss and fragmentation in its range, which is why it is a CDFG Species of Special Concern (CDFG 2011a). Species of Special Concern are designated as such “because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction” (CDFG 2011b, p. 9). Approximately 45% of habitat within the species’ Southern California range had been converted to urban development or agriculture by 1994, and populations had been reduced by collection for the curio trade (Jennings and Hayes 1994). There are few extant populations in the southern coastal region (Jennings and Hayes 1994).

Reasons for Decline

The high site-fidelity, the relatively specialized diet and habitat requirements, and the defensive behavior based on crypsis (behavior or coloring that makes it difficult to observe), make the coast horned lizard especially vulnerable to disturbance (Jennings and Hayes 1994; CDFG 2007e). The main threats to the coast horned lizard are habitat loss and fragmentation, and the spread of the Argentine ant (CDFG 2007e).

Habitat fragmentation is considered a major threat to coast horned lizard populations because coast horned lizards probably have limited mobility and relatively small home ranges (Jennings and Hayes 1994; CDFG 2007e). They are considered to be relatively sedentary animals and thus unsuitable habitat and physical obstacles, such as roads separating suitable habitat patches, likely act as a significant barrier to dispersal (Jennings and Hayes 1994).

Argentine ants colonize disturbed soils associated with building foundations, roads, and landfills, and expand into adjacent areas, eliminating native ant colonies (Ward 1987). In most of its range, the Argentine ant can displace most or all of the native ant populations. As up to 90% of the diet of the coast horned lizard consists of native harvester ants (Pianka and Parker 1975), Argentine ants can eliminate the primary food source of the species and in Southern California, this impact is considered to have greatly reduced the numbers of the coast horned lizard (Suarez and Case 2002). In addition, the overuse of pesticides can lead to a reduction in the number of harvester ants and other invertebrate prey of the coast horned lizard.

Other known threats to coast horned lizard include pets (especially cats), off-road vehicles, over-grazing, frequent fires that may cause long-term habitat transitions from scrub to annual grasslands, and vehicle collisions (Jennings and Hayes 1994).

5.2.5.1.2 HABITAT CHARACTERISTICS AND USE

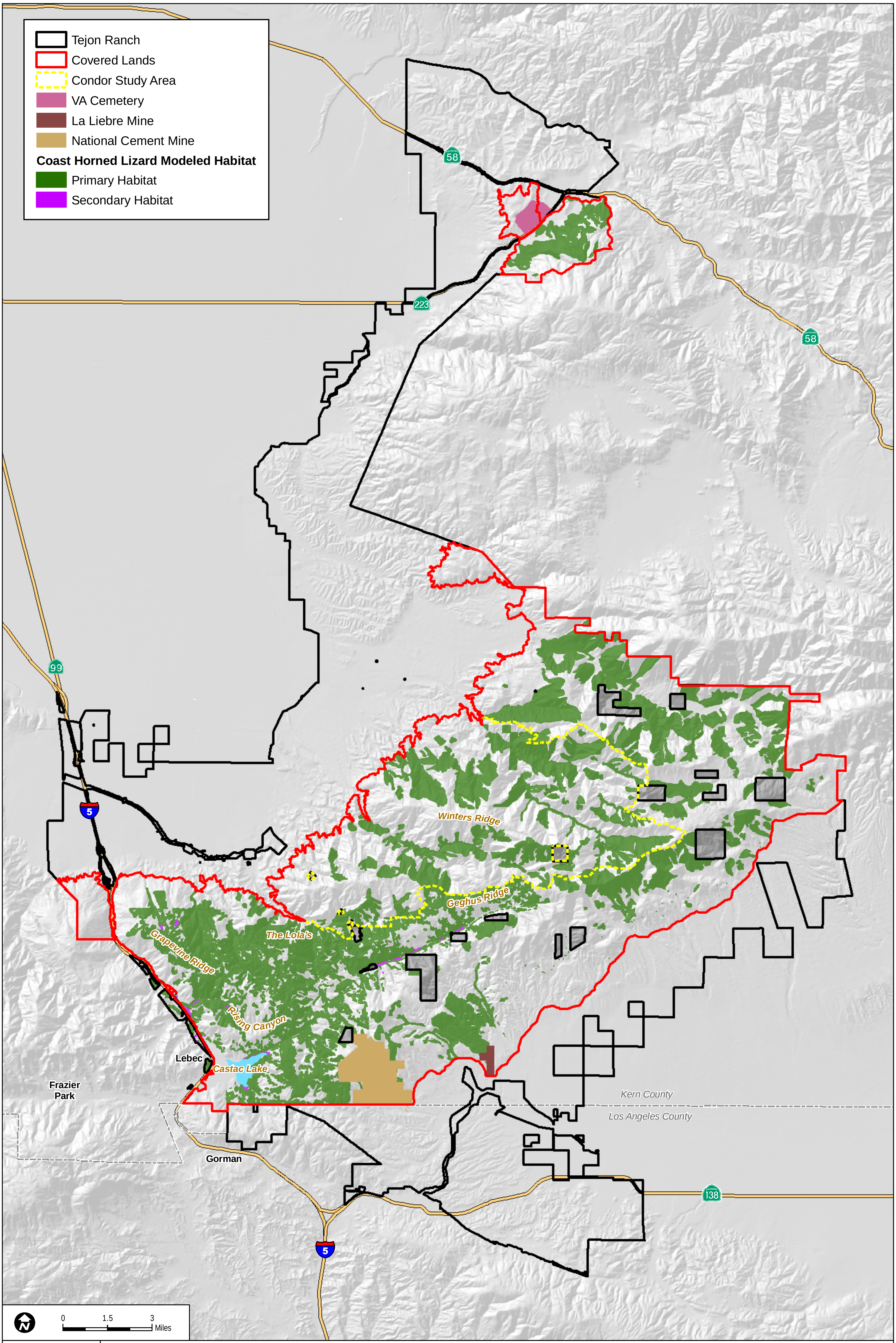
Despite a wide-ranging distribution, the coast horned lizard seems to be restricted to localized populations because of its association with loose soils that have a high sand content (Jennings and Hayes 1994). The species is found in a wide variety of vegetation types with the requisite loose sandy soils, including California sagebrush scrub, annual grassland, chaparral, oak woodland, riparian woodland, and coniferous forest (Klauber 1939; Stebbins 1954). Other identified habitat characteristics include open areas with limited overstory for basking and low, but relatively dense shrubs for refuge (Jennings and Hayes 1994). In inland areas, the species is restricted to areas with pockets of open microhabitat, created by disturbance (e.g., floods, fire, roads, grazed areas, fire breaks) (Jennings and Hayes 1994).

5.2.5.1.3 OCCURRENCE IN THE COVERED LANDS

Habitat assessments for special-status reptile species, including coast horned lizard, were conducted in the TMV Planning Area in 2007 by Dudek based on known habitat associations and elevational limits of the species (Dudek 2009). Focused surveys were not conducted for the coast horned lizard (e.g., systematic transects or pitfall trapping), but incidental observations of this species during wildlife surveys were recorded. The coast horned lizard was observed in Rising Canyon, north of Castac Lake, and on a ridge above Silver Canyon during the 2007 surveys conducted by Dudek, and it is expected to occur in suitable habitat throughout the Covered Lands (Dudek 2009). It was also reported as being observed on the site during surveys in 2001 and 2002 (Impact Sciences, Inc. 2004) and in 2005 (Jones and Stokes 2006a). See *Appendix D.1* for more detailed information on survey methods.

Suitable habitat for coast horned lizard was modeled for all Covered Lands (see *Appendix D* for habitat modeling methods). The model included primary and secondary habitat at all elevations for Covered Lands. Suitable primary habitat is defined as the main habitat used by coast horned lizard and that meets all of its life history requirements. Suitable secondary habitat is defined as habitat that may be used less frequently and may not be adequate to meet all or most life history requirements of the species; typically, secondary habitat alone is not adequate to support a species. Modeled suitable primary habitats on Covered Lands are grassland, scrub, wash, woodland (less than 70% canopy cover), and conifer. Modeled suitable secondary habitats on Covered Lands are riparian woodland, riparian scrub, and riparian/wetland.

Modeled suitable habitat within Covered Lands for coast horned lizard is shown in *Figure 5-21, Coast Horned Lizard Modeled Suitable Habitat*. A total of 41,083 acres of primary habitat and 62 acres of secondary habitat for coast horned lizard was modeled for Covered Lands. However, because it is unlikely that all modeled suitable habitat would be saturated, and because it is assumed that some modeled suitable habitat may not contain the microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species.



SOURCE: TRC 2007

FIGURE 5-22

Coast Horned Lizard Modeled Suitable Habitat

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5.2.5.2 TWO-STRIPED GARTER SNAKE

The two-striped garter snake (*Thamnophis hammondii*) is medium in size (24 to 40 inches) (Jennings and Hayes 1994) and has a single lateral yellow–orange stripe on each side of the body, while the dorsal coloration can vary from olive, brown, to brownish grey (Jennings and Hayes 1994). The lateral stripes may be absent in some individuals, especially in the northern third of this species range (Jennings and Hayes 1994). Where the mid-dorsal stripe may be absent, a nuchal (pertaining to the nape of the neck) spot may be present on the back of the neck. The iris is a light tan color (Jennings and Hayes 1994).

5.2.5.2.1 STATUS AND DISTRIBUTION

Regulatory History

The two-striped garter snake has no Federal designation, but is a CDFG California Species of Concern (CDFG 2011a).

Natural History

The two-striped garter snake is an aquatic snake and is not found far from water (Jennings and Hayes 1994). Two-striped garter snakes require the presence of aquatic habitats for their prey items, foraging in and along streams and near quiet pools of water (Zeiner et al. 1990a). They prey on small fish, fry, and eggs (*Cottus* sp., *Eucyclogobius* sp., *Gasterosteus* sp., *Oncorhynchus* sp.); frogs and toads (*Bufo* sp., *Rana* sp., *Pseudacris* sp.); newts (*Taricha* sp.); leeches and earthworms (*Annelida*); and insect larvae (*Anthropoda*) (Jennings and Hayes 1994). Two-striped garter snakes are preyed upon by raptors (*Accipitridae*), shrikes (*Lanius* sp.), herons (*Ardea* sp.), raccoons, coyotes (*Canis latrans*), snakes (*Viperidae* and *Colubridae*), bass (*Morone* sp. and *Micropterus* sp.), feral pigs (*Sus scrofa*), and bullfrogs (*Rana catesbeiana*) (Jennings and Hayes 1994; Stebbins 2003). However, the species has the ability to evade predators with its excellent swimming skills. The species is capable of energetically defending itself when cornered and will emit a musky defense from a post-anal gland (Zeiner et al. 1990a; Stebbins 2003).

Two-striped garter snakes are generally active aquatic hunters during the day, but retreat into crevices, mammal burrows, or other upland shelters at night (Zeiner et al. 1990a). Their streamside home range is 0.012 to 1.2 acres with a median home range of 0.37 acre; a winter home range through coastal sage scrub and grasslands in upland areas adjacent to riparian areas is 0.012 to 2.2 acres with a median home range of 0.84 acre (Jennings and Hayes 1994). Two-striped garter snakes are not territorial (i.e., individual home ranges show substantial overlap). The median summer home range of 0.37 acre can support up to seven two-striped garter snakes, while the winter range of 0.84 acre can support up to three two-striped garter snakes (Zeiner et al. 1990a). This mostly diurnal snake is most active in mornings and nights of warm days and warm afternoons of cooler days (Zeiner et al. 1990a). The two-striped garter snake generally retreats to communal hibernation burrows as the days shorten, generally in October and depending on latitude and elevation (Jennings and Hayes 1994). Occasionally on warmer days, the species will emerge from torpor to sun. Two-striped garter snakes in Southern California found at higher elevations, inland, and colder areas hardly emerge from their hibernation dens (Zeiner et al. 1990a). Hibernation lasts until March when the males emerge first and prepare for mating.

During the spring emergence, males court and mate with females (Schwenkmeyer 2007). Both male and female two-striped garter snakes may breed with several partners, but not all females will mate in a given season. Sexually mature females are able to store sperm for up to 53 months and may still give birth without mating that season (Jennings and Hayes 1994). After mating has occurred in upland sites, two-striped garter snakes disperse to summer feeding areas. Gravid females will gestate for 9 weeks. They will bear one to 25 live young during the late summer or fall in or under loose bark, rotting logs, and dense vegetation (Zeiner et al. 1990a; Jennings and Hayes 1994; Stebbins 2003; Schwenkmeyer 2007).

Distribution and Population Trends

The two-striped garter snake is endemic to Southern California and Baja Peninsula, Mexico, and is found through coastal California in the vicinity of the southeast slope of the Diablo Range and the Salinas Valley south along the Coastal and Transverse Ranges to Rio Rosario in Baja California, Mexico (NatureServe 2010). Records for the two-striped garter snake in California include sightings along riparian areas through the South Coast and Peninsular Ranges, west of the San Joaquin Valley, and in deserts in the vicinity of the Salinas (Monterey County) and Cantua Creeks (Fresno County), and south to La Presa, Baja California (Jennings and Hayes 1994).

There are no specific data regarding population trends for the two-striped garter snake, but it is clear that populations have declined since 1945, including documented extirpations of many local populations along the immediate coast (Jennings and Hayes 1994). Although the species was historically common throughout coastal–central and Southern California, as a result of habitat loss and other disturbances, it is now common only in eastern San Diego County (Jennings and Hayes 1994). It is estimated that as of 1994, the two-striped garter snake had been extirpated from approximately 40% of its historical range (Jennings and Hayes 1994).

Reasons for Decline

Populations of two-striped garter snakes have been affected by the elimination of natural sloughs and wetlands; loss of riparian habitat due to agriculture and urbanization; predation by non-native bullfrogs, fish, and feral pigs; and loss of amphibian prey. In addition to direct loss of habitat, two-striped garter snakes are vulnerable to several effects related to urbanization. Loss and alteration of aquatic habitat is the greatest threat to the two-striped garter snake. Large reservoirs, cement-lined stream channels, flood control projects, and barriers to dispersal such as highways, highway obstructions, densely urbanized areas, and areas dominated by buildings and pavement all impede the life cycle and natural movements of the garter snake (Jennings and Hayes 1994; NatureServe 2010). As high-quality habitat is lost and two-striped garter snake is forced into more marginal territory, they come into direct competition with nonnative animal species. Predation by introduced bullfrogs, fish, and feral pigs places new pressure on the two-striped garter snake (Zeiner et al. 1990a). Furthermore, the loss of amphibian prey creates new strain on the diets of two-striped garter snakes. The two-striped garter snake regularly consumes newts and treefrogs, but the eggs and young of these prey items are being lost to predation by the widely introduced mosquitofish (*Gambusia affinis*) (Goodsell and Kats 1999).

5.2.5.2.2 HABITAT CHARACTERISTICS AND USE

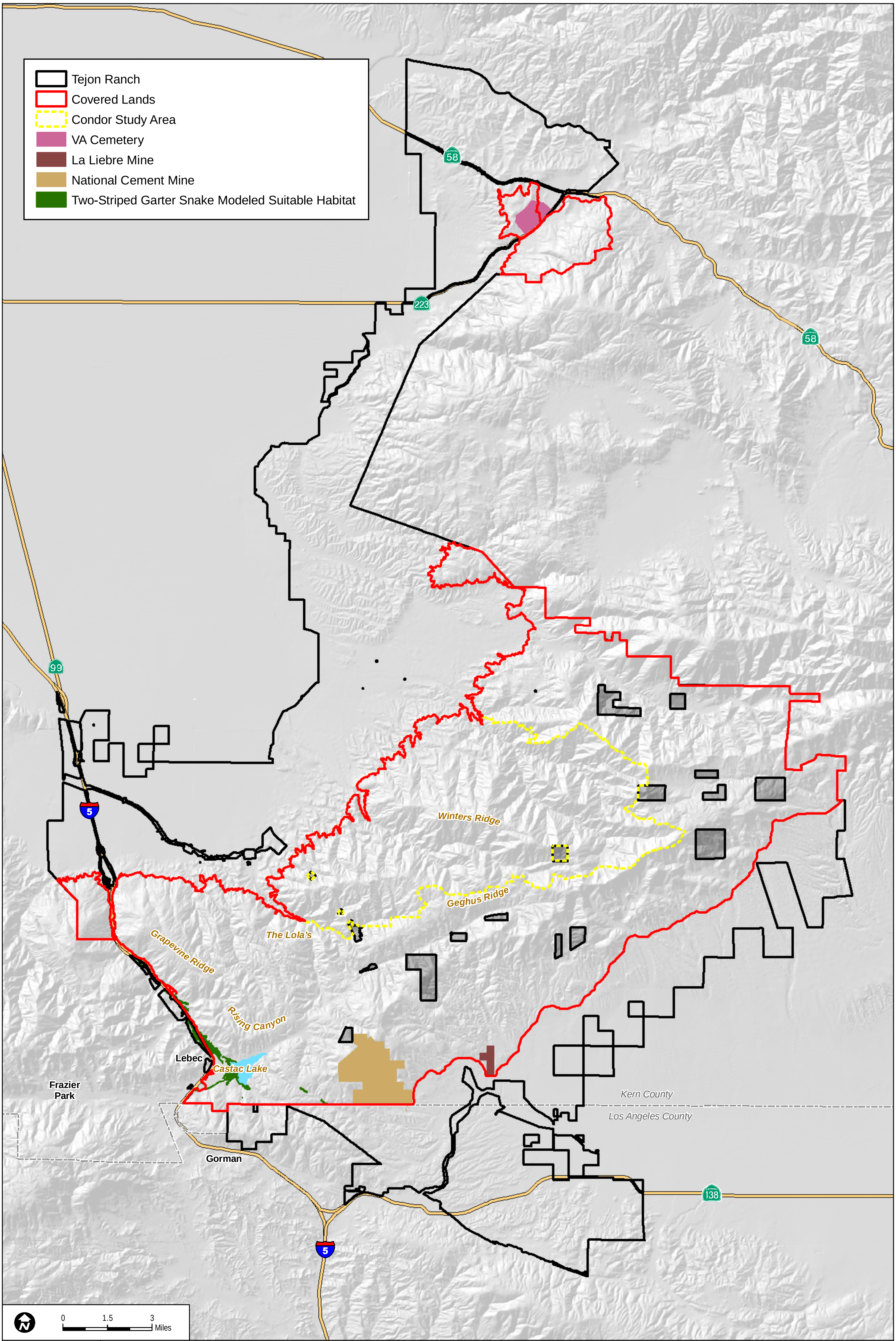
Two-striped garter snakes are found in a variety of perennial and intermittent freshwater streams within oak woodlands, shrublands, and sparse coniferous forests from sea level to 7,874 feet amsl (Stebbins 2003; Zeiner et al. 1990a). They are restricted to streams, vernal pools, lakes, and stock and artificial ponds with good adjoining riparian vegetation (Jennings and Hayes 1994; Schwenkmeyer 2007) and are commonly found within wetlands and streams having rocky or sandy beds with willows or dense vegetation (Zeiner et al. 1990a). Two-striped garter snakes tend to stay near water, entering it and retreating to it when alarmed (Stebbins 2003). They use dense vegetation, flat rocks, rocky outcrops, and rotting logs as cover (Zeiner et al. 1990a). At night, two-striped garter snake retreat to burrows, crevices, and surface objects with other snakes for protection and thermoregulation (Zimmerman 2002). The species tend to avoid open areas because of increased risk of predation.

5.2.5.2.3 OCCURRENCE IN THE COVERED LANDS

Habitat assessments for special-status reptile species, including two-striped garter snake, were conducted in the TMV Planning Area in 2007 by Dudek based on known habitat associations (Dudek 2009). Focused surveys were not conducted for the two-striped garter snake. The two-striped garter was observed in the TMV Planning Area during the 2007 surveys within Grapevine Creek, adjacent to Pastoria Creek in Beartrap Canyon, and within a drainage running through Dry Field Canyon (Dudek 2009). This species was also observed in 2001, 2002, and 2003 at Castac Lake adjacent to the TMV Project and at an on-site stock pond south of the lake. The two-striped garter snake was not observed during 2005 wildlife surveys (Jones and Stokes 2006a). See *Appendix D.1* for more detailed information on survey methods.

Suitable habitat for two-striped garter snake was modeled for all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitats on Covered Lands are riparian woodland, riparian scrub, riparian/wetland, wetland, and wash. Modeled suitable habitats also include areas within 100 feet of either side of perennial streams, seeps, and springs.

Modeled suitable habitat within Covered Lands for two-striped garter snake is shown in *Figure 5-22, Two-Striped Garter Snake Modeled Suitable Habitat*. A total of 364 acres of suitable habitat for two-striped garter snake was modeled for Covered Lands. However, because it is unlikely that all modeled suitable habitat would be saturated, and because it is assumed that some modeled suitable habitat may not contain the microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species.



SOURCE: TRC 2007

FIGURE 5-22

Two-Striped Garter Snake Modeled Suitable Habitat

Draft Tehachapi Uplands MSHCP

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5.3 PLANTS

5.3.1 FORT TEJON WOOLLY SUNFLOWER

Fort Tejon woolly sunflower (*Eriophyllum lanatum* var. *hallii*) is a perennial herb in the Sunflower Family (*Asteraceae*) that grows to between 4 inches and 3 feet in height (Smith 1998). Its thin, oval leaves are 1 to 2 inches long and pinnately lobed (Hickman 1996).

Eriophyllum lanatum is a complex of intergrading races with different ploidy[14] levels, and key characteristics described in the Jepson Manual are for central characteristics. Most individuals are short-lived, woody-based perennials (Mooring 2001). The Fort Tejon woolly sunflower has the basic diploid number of 16 chromosomes; it differs from all other varieties in that the tubes of its disk flowers are glabrous (Jepson Flora Project 2011).

5.3.1.1 STATUS AND DISTRIBUTION

Regulatory History

Fort Tejon woolly sunflower has no Federal or state designation, but has a California Rare Plant Rank (CRPR, previously known as the CNPS List) of 1B.1; 1B species are considered rare, threatened, or endangered in California and elsewhere (CDFG 2011d). In addition, it has a California Heritage Element Ranking of S1, meaning that it is critically imperiled in the state because of extreme rarity (often five or fewer occurrences) or because of some factor(s), such as very steep declines, making it especially vulnerable to extirpation from the state (CDFG 2011d).

Natural History

The Fort Tejon woolly sunflower blooms between May and July. Large, attractive flower heads of various taxa within the *Eriophyllum lanatum* complex are visited by beetles, several species of bees, syrphid flies, and lepidopterans, while bagging studies of garden plants indicated self-incompatibility approaching 99% (Mooring 1975). Seed-eating insect larvae, possibly fruit fly, have been observed infesting and damaging the plants (Smith 1998). The fruit is typically 4 to 5 millimeters long (Hickman 1996) and dispersal is likely by gravity.

Distribution and Population Trends

The range of the Fort Tejon woolly sunflower is considered to be the southern Tehachapi Mountains (near Fort Tejon) and the Sierra Madre Mountains in the southeastern Outer South Coast Ranges (Jepson Flora Project 2011). It occurs in Kern, Ventura, and Santa Barbara Counties.

[14] The basic number of chromosomes.

Specific population trends for Fort Tejon woolly sunflower are unknown. The species is endemic to the southern Tehachapi Mountains (near Fort Tejon) and the Sierra Madre Mountains in the southeastern Outer South Coast Ranges (Jepson Flora Project 2011). It occurs in a narrow distribution in southwestern Kern, northeastern Ventura, and western Santa Barbara Counties (CNPS 2010; CDFG 2011a). Besides the documented occurrences in the TMV Planning Area, there are currently six records for the species in the CNDDB database (CDFG 2011a), including 2004 records from Tejon Ranch, and CNPS (2010) indicates that it is known from fewer than five occurrences. Other than the occurrences documented in the TMV Planning Area, the largest documented population on approximately 19 acres in Santa Barbara County was 850 individuals when last observed in 1994 (CDFG 2011a). The other occurrence in Los Padres National Forest had 37 plants when last observed in 1994. No number of individuals was provided for one population reported in Johnson Canyon west of Fort Tejon. The occurrence east of Johnson Canyon and north of O'Neil Canyon had an estimated 530 plants in 1987 (CDFG 2011a). Data collected in the TMV Planning Area are described in detail below in Section 5.3.1.3.

Reasons for Decline

Road construction and maintenance, erosion, and development are considered threats to specific populations of Fort Tejon woolly sunflowers (CDFG 2011a). In addition, the Fort Tejon woolly sunflower is threatened by grazing and trampling by cattle and livestock (CNPS 2010).

5.3.1.2 HABITAT CHARACTERISTICS AND USE

General habitat for the Fort Tejon woolly sunflower is in openings of chaparral and cismontane woodland vegetation, often on slopes in loamy soils. It occurs at elevations from 3,500 to 4,900 feet amsl (CNPS 2010). The largest reported population was observed growing in a colony on a north-facing (0 to 90 degrees and 0 to 270 degrees) slope with Tucker oak chaparral and pinyon–juniper woodland nearby. The plants were growing on friable soil in a roadside bank (Smith 1998) and on the silt loam soil of the road itself. Fort Tejon woolly sunflower also occurs in other microhabitats, such as a rocky canyon in the upper Sonoran zone, openings in chaparral, and a steep slope with sandy-clay loam soils (CDFG 2011a).

Plant species associated with the Fort Tejon woolly sunflower are blue oak, valley oak, shrub live oak (*Quercus turbinella*), scrub oak (*Quercus berberidifolia*), singleleaf pinyon pine (*Pinus monophylla*), silk tassle bush (*Garrya flavescens* ssp. *pallida*), short-leaved cliff aster (*Malacothrix saxatilis*), California coffeeberry (*Rhamnus californica*), rubber rabbitbrush (*Chrysothamnus nauseosus*), and silver lupine (*Lupinus albifrons*) (CDFG 2011a).

As described in Section 5.3.1.3, during various surveys conducted in portions of the Covered Lands, Fort Tejon woolly sunflower was observed primarily on gravelly loam between 3,600 and 5,000 feet amsl in elevation (Dudek 2009; Intermap Technologies Inc. 2005). The majority of these occurrences are on young alluvial terraces and debris flows and granite and quartz monzonite (Dudek 2009). In the Covered Lands, this taxon is primarily associated with oak woodlands, although it has also been observed in scrub (Dudek 2009, 2007c). This taxon was primarily observed on north- and south-facing slopes versus east- or west-facing slopes or relatively flat areas (Dudek 2009; Intermap Technologies Inc. 2005). All occurrences in the Covered Lands occur on slopes that are not considered steep (less than 45 degrees) (Dudek 2009; Intermap Technologies Inc. 2005). None of the occurrences on site are located within recently burned areas.

5.3.1.3 OCCURRENCE IN THE COVERED LANDS

Surveys for special-status plants, including Fort Tejon woolly sunflower, were conducted in successive years from 2003 through 2007 in the TMV Planning Area. The pre-2007 surveys covered the portion of the TMV Planning Area that was initially identified for impacts, and the 2007 survey covered the entire 28,253-acre TMV Planning Area, including proposed open space. Vollmar Consulting conducted plant surveys in 2003 and 2004 covering approximately 4,500 acres of the TMV Planning Area (Vollmar Consulting 2004). Jones and Stokes conducted plant surveys in 2005 and 2006 covering the areas within the TMV Planning Area previously surveyed by Vollmar Consulting and some additional portions of the site (Jones and Stokes 2006a, 2006b). See *Appendix D.1* for more detailed information on survey methods.

Dudek conducted the 2007 surveys and used data collected during these earlier surveys to prepare a target list of special-status plant species that could potentially occur (Dudek 2009). The data collected from these earlier surveys were also mapped on field maps used during the 2007 survey (Dudek 2009). Dudek also reviewed the online version of the CNPS Inventory of Rare and Endangered Plants (CNPS 2008) and conducted a CNPS nine-quad search for the Lebec, Pastoria Creek, Frazier Mountain, Grapevine, Winters Ridge, and La Liebre Ranch quadrangles. Other background sources for the special-status plant surveys included *Vascular Flora of the Liebre Mountains, Western Transverse Ranges, California* (Boyd 1999); *A Flora of Kern County* (Twisselman 1967); *The Jepson Manual: Higher Plants of California* (Hickman 1996); and *Soil Survey of Kern County, California, Southeastern Part* (Valverde and Hill 1981). Finally, Dudek compared elevation ranges (calculated from the Digital Terrain Model (DTM) created in 2006 (Intermap Technologies 2005)) to known elevation ranges for potentially occurring special-status plant species, such as Fort Tejon woolly sunflower.

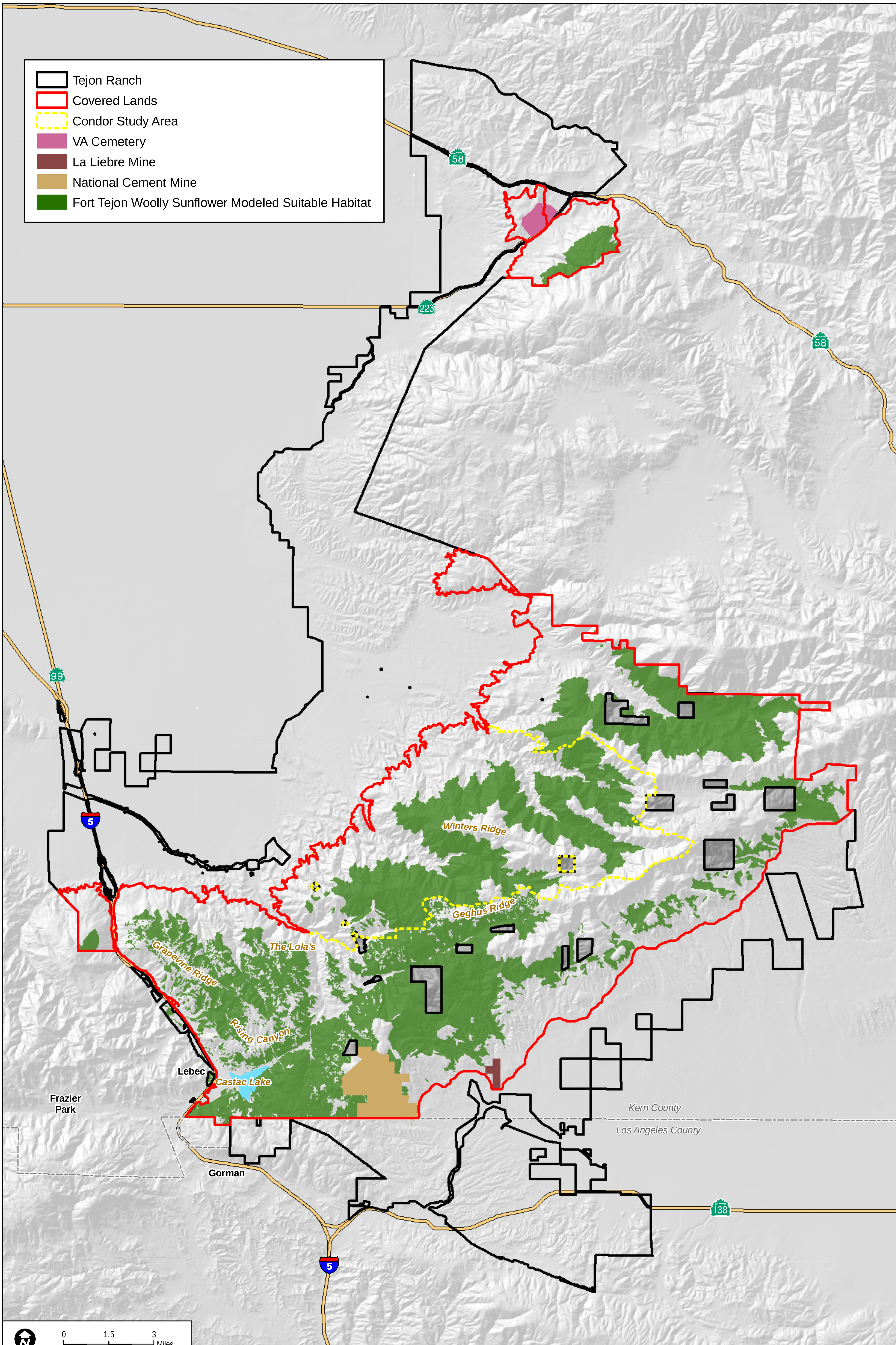
In 2007, the Dudek-supervised botanical survey team conducted two passes of field surveys during the spring/early summer (April 16 through July 9, 2007), plus a third pass in mid-July and late September 2007 for late-blooming species (Dudek 2009). The botanical survey team spent a total of 748 person-days (approximately 7,476 hours), covering roughly 50 to 75 acres per week, conducting focused surveys for special-status plants, including the Fort Tejon woolly sunflower.

In 2007, 36 occurrences of Fort Tejon woolly sunflower were recorded in the TMV Planning Area, representing 3,000 to 8,500 individuals located at elevations between 3,600 and 5,000 feet, with the majority detected between 3,800 and 4,000 feet (Dudek 2009). This species was observed in a variety of geological settings and primarily on young alluvium terraces and debris flows and granite to quartz monzonite, and within soils that primarily included gravelly loam, with a small number of individuals occurring in sandy loam and rock outcrops. Most of the on-site observations occurred on north- or south-facing slopes that range from 5 to 45 degrees (Dudek 2009).

There are no other CNDDB occurrences documented in the Covered Lands; however, there are occurrences west of Interstate 5 near Fort Tejon State Historic Park (CDFG 2011a).

Suitable habitat for this species was modeled on all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitats on Covered Lands are chaparral, conifer, riparian woodland, scrub, oak woodland, and oak savannah that occur at elevations between 3,400 and 5,000 feet and on all soils.

Modeled suitable habitat within Covered Lands for Fort Tejon woolly sunflower is shown in *Figure 5-23, Fort Tejon Woolly Sunflower Modeled Suitable Habitat*. A total of 57,430 acres of suitable habitat for Fort Tejon woolly sunflower was modeled for Covered Lands.



SOURCE: TRC 2007

FIGURE 5-23

Fort Tejon Woolly Sunflower Modeled Suitable Habitat

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5.3.2 KUSCHE'S SANDWORT

Kusche's sandwort (*Eremogone macradenia* var. *arcuifolia* [=*Arenaria macradenia* var. *kuschei*]) is a perennial herb in the pink family (*Caryophyllaceae*). It is a tufted plant that grows about 1 foot high, bearing a somewhat compact inflorescence that is densely glandular and hairy (Jepson Flora Project 2011).

In *Flora of North America* (Hartman et al. 2005), *Arenaria macradenia* var. *kuschei* is treated as a synonym of the more widespread *Eremogone macradenia* var. *arcuifolia*, distributed in the southern Sierra Nevada and San Gabriel Mountains. *A. m.* var. *kuschei* may be an extreme local variant of *E. m.* var. *arcuifolia* (Stephenson and Calcarone 1999). Although morphologically similar, *A. m.* var. *kuschei* differs from *E. m.* var. *arcuifolia* in its densely stipulate-glandular inflorescence (peduncles, pedicels, and calyces) (Jepson Flora Project 2011).

5.3.2.1 STATUS AND DISTRIBUTION

Regulatory History

Arenaria macradenia var. *kuschei* was formerly recognized by the CNDDB and CNPS as a special-status species. Based on recent collections, it was determined that *A. m.* var. *kuschei* intergrades completely with *E. m* var. *arcuifolia* (Hartman et al. 2005). This taxon currently has no Federal, state, or CNPS special status.

Natural History

This perennial herb blooms from June to July (CNPS 2008). The flowers are very small: petals are 6 to 11 millimeters long and sepals are 5 to 7 millimeters long and densely glandular hairy, and desert sandwort fruits are 1.8 to 2.7 millimeters long (Hickman 1996). Pollinators have not been identified for Kusche's sandwort but pollinator studies for a related species (*Arenaria serpyllifolia*) revealed that ants were the primary pollinator (Mayer and Gottsberger 2002). Dispersal information is not available for Kusche's sandwort; however, a related species (*Arenaria norvegica* ssp. *anglica*) is known to have low dispersal ability (YDNPA 2008) and dispersal is likely via gravity. Light grading and other similar activities may benefit the perennial by creating openings or gaps within the vegetation for seedling establishment (Stephenson and Calcarone 1999).

Distribution and Population Trends

Specific population trends for Kusche's sandwort are unknown. Although it was once considered a CNPS List 1B.1 plant species, indicating that it was considered seriously endangered in California; it has since been removed from the list because it is too common (CNPS 2010). However, the discussion below assumes that Kusche's sandwort may be an extreme local variant of *E. m.* var. *arcuifolia*, and as such is treated as if it were special-status with regard to distribution, habitat associations, and threats.

General habitat for Kusche's sandwort is in openings in chaparral on granitic soil. It has also been reported in open black oak and canyon live oak woodland, and sparse low scrub and subshrubs within dense chaparral. This species occurs on decomposed and thin granitic soils at elevations between 4,000 and 6,890 feet. The range of Kusche's sandwort is limited to the western Transverse Ranges (Jepson Flora Project 2011), and the only previous known occurrences were at Liebre Mountain in Los Angeles County (CDFG 2007a).

Reasons for Decline

Kusche's sandwort may be threatened by land management activities, road maintenance, and vehicles. Road maintenance may directly or indirectly impact the populations along 7N23 and off-highway vehicle damage may threaten the populations near the head of Tentrock Canyon and on the ridge between Bear and Fish Canyons (Stephenson and Calcarone 1999). In addition, populations on the west summit of Liebre Mountain may be threatened by trampling by campers. Populations on the ridgeline between Bear and Fish Canyons are susceptible to disturbance related to fuel modification zone maintenance (Stephenson and Calcarone 1999). Two recorded occurrences from Soledad Canyon in Los Angeles County are at risk from private land development and mining.

Because the known populations are highly restricted and small, Kusche's sandwort may be sensitive to stochastic change (Stephenson and Calcarone 1999). Vegetation management activities, such as "crush and burn" practices, have been proposed in the Angeles National Forest within the habitat for Kusche's sandwort (Ross and Boyd 1996).

5.3.2.2 HABITAT CHARACTERISTICS AND USE

Openings in chaparral on granitic soil provide habitat for Kusche's sandwort between 3,660 and 5,100 feet amsl (CNPS 2008). It has also been reported in open black oak and canyon live oak woodland, and sparse low scrub and subshrubs within dense chaparral (CDFG 2008c). All known occurrences of Kusche's sandwort have been reported from areas of gentle to moderate topography (CDFG 2008c).

Species associated with this species include: birch-leaf mountain-mahogany (*Cercocarpus betuloides* var. *betuloides*), procumbent lotus (*Lotus procumbens*), canyon live oak, ripgut brome (*Bromus diandrus*), one-sided bluegrass (*Poa secunda*), junegrass (*Koeleria macrantha*), and California-aster (*Corethrogyne filaginifolia*) (Dudek 2009).

As described in Section 5.3.2.3, during various surveys conducted in portions of the Covered Lands, Kusche's sandwort has been observed on granite to quartz monzonite, young alluvial terraces, and debris flows between 3,800 and 4,200 feet (Dudek 2009; Intermap Technologies Inc. 2005). Kusche's sandwort was observed in a canyon live oak forest (Dudek 2009). In the Covered Lands, the majority of occurrences were found on north-facing (0 to 90 degrees and 0 to 270 degrees) slopes from 15 to 45 degrees in steepness, although this taxon was also present on steeper slopes (Dudek 2009; Intermap Technologies Inc. 2005).

5.3.2.3 OCCURRENCE IN THE COVERED LANDS

Surveys for special-status plants, including Kusche's sandwort, were conducted in successive years from 2003 through 2007 in the TMV Planning Area. The pre-2007 surveys covered the portion in the TMV Planning Area that was initially identified for impacts, and the 2007 survey covered the entire 28,253-acre TMV Planning Area, including proposed open space. Vollmar Consulting conducted plant surveys in 2003 and 2004 covering approximately 4,500 acres of the TMV Planning Area (Vollmar Consulting 2004). Jones and Stokes conducted plant surveys in 2005 and 2006 covering the areas within the TMV Planning Area previously surveyed by Vollmar Consulting and some additional portions of the site (Jones and Stokes 2006a, 2006b). See *Appendix D.1* for more detailed information on survey methods.

Dudek conducted the 2007 surveys and used data collected during these earlier surveys to prepare a target list of special-status plant species that could potentially occur (Dudek 2009). The data collected from these earlier surveys were also mapped on field maps used during the 2007 survey (Dudek 2009). Dudek also reviewed the online version of the CNPS Inventory of Rare and Endangered Plants (CNPS 2008) and conducted a CNPS nine-quad search for the Lebec, Pastoria Creek, Frazier Mountain, Grapevine, Winters Ridge, and La Liebre Ranch quadrangles. Other background sources for the special-status plant surveys included *Vascular Flora of the Liebre Mountains, Western Transverse Ranges, California* (Boyd 1999); *A Flora of Kern County* (Twisselman 1967); *The Jepson Manual: Higher Plants of California* (Hickman 1996); and *Soil Survey of Kern County, California, Southeastern Part* (Valverde and Hill 1981). Finally, Dudek compared elevation ranges (calculated from the DTM created in 2006 (Intermap Technologies 2005)) to known elevation ranges for the potentially occurring special-status plant species, such as Kusche's sandwort.

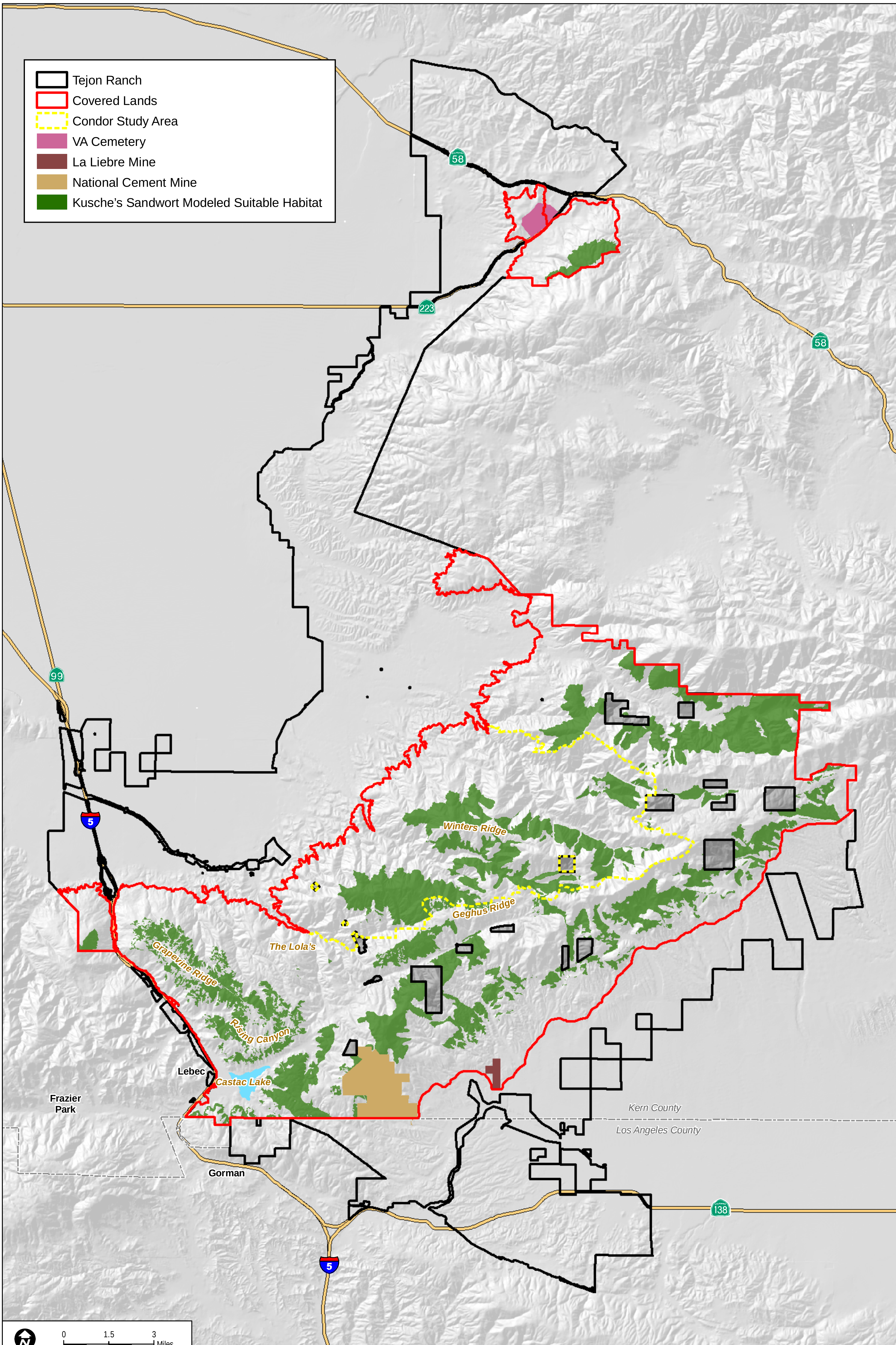
In 2007, the Dudek-supervised botanical survey team conducted two passes of field surveys during the spring/early summer (April 16 through July 9, 2007), plus a third pass in mid-July and late September 2007 for late-blooming species (Dudek 2009). The botanical survey team spent a total of 748 person-days (approximately 7,476 hours), covering roughly 50 to 75 acres per week, conducting focused surveys for special-status plants, including the Kusche's sandwort.

In 2007, Kusche's sandwort was documented in seven separate occurrences in the TMV Planning Area, representing approximately 24 individuals of this perennial herb (Dudek 2009). This species occurs at elevations between 3,800 and 4,200 feet. The occurrences were documented on granite to quartz monzonite and young alluvium, terraces, and debris flows, and only within Tunis–Walong complex soils. Kusche's sandwort was found solely on north-facing slopes greater than 15 degrees, with a few occurrences on slopes greater than 45 degrees. This species was mapped within canyon live oak forest and woodlands on site.

There are no CNDDB records of Kusche's sandwort in the Covered Lands; however, there are five CNDDB occurrences of Kusche's sandwort south of the Covered Lands in northern Los Angeles County, approximately 7 miles south of the Covered Lands boundary on the ridgeline of Liebre Mountain (CDFG 2007a; TRC 2007).

Suitable habitat for this species was modeled on all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitat on Covered Lands includes oak woodlands and forests, chaparral, and riparian forest and woodlands on granitic soils within an elevation range of 3,800 to 5,600 feet. A version of the model was also run for areas in the western portion of Covered Lands that do not have soils data.

Modeled suitable habitat within Covered Lands for Kusche's sandwort is shown in *Figure 5-24, Kusche's Sandwort Modeled Suitable Habitat*. A total of 30,505 acres of suitable habitat for Kusche's sandwort was modeled for Covered Lands with soils data, and 2,821 acres of suitable habitat was modeled on Covered Lands without soils data.



SOURCE: TRC 2007

FIGURE 5-24

Kusche's Sandwort Modeled Suitable Habitat

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5.3.3 ROUND-LEAVED FILAREE

Round-leaved filaree (*California macrophylla*) is a prostrate, annual, or biennial plant in the Geranium family (*Geraniaceae*) (Jepson Flora Project 2011). Its population size fluctuates annually, depending on environmental conditions, such as rainfall frequency, duration, timing and quantity, and temperature. It is usually less than 2 inches tall and has glandular stems and opposite, simple, kidney-shaped leaves. It is the sole member of the genus *California*, which has recently been segregated from the genus *Erodium* based on morphological and molecular characteristics (Jepson Flora Project 2011). Round-leaved filaree germinates after winter rains, forming a basal rosette from 1 inch to 1 foot in diameter, until it bolts and sends up umbellate inflorescences in the spring and early summer months. The flowers are small and white, tinged red to purple (Jepson Flora Project 2011).

5.3.3.1 STATUS AND DISTRIBUTION

Regulatory History

Round-leaved filaree has no Federal or state designation, but has a CRPR of 1B.1; 1B species are considered rare, threatened, or endangered in California and elsewhere (CDFG 2011d). This species has a California Heritage Element Ranking of S2, indicating a very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation from the state (CDFG 2011c).

Natural History

Round-leaved filaree typically blooms between March and July (Jepson Flora Project 2011). The flowers are open for only 1 day, with the anthers enclosing the stigma after the petals drop to self-pollinate (Gillespie 2003). The mature fruiting body can disperse itself up to 5 feet from the parent plant in the absence of wind (Gillespie 2003). Because round-leaved filaree self-pollinates and disperses its seeds via dehiscent carpel walls, typical native pollinators, such as ants, do not appear to play a significant role in either pollination or seed dispersal of this species (Gillespie 2003).

This species' response to fire is complex. A study of this species' response to various treatments (e.g., fire, weeding) showed that the establishment of round-leaved filaree declined after fire disturbance, but seed production increased (Gillespie and Allen 2004). In addition, Gillespie (2003) found that removal of non-native grasses (e.g., by weeding or fire) favored the establishment of round-leaved filaree.

Distribution and Population Trends

Specific population trends for round-leaved filaree are unknown. The range of round-leaved filaree extends from northern Mexico to Oregon and southern Utah (CNPS 2010; Jepson Flora Project 2011). It is reported in 27 counties in California, from Lassen to San Diego. It may be extirpated from Santa Cruz Island and Butte County (CNPS 2010). Gillespie (2003) determined that 105 unique populations have been reported, with most on the eastern side of the California Coast Ranges. The Jepson Online Interchange for California Floristics (Jepson Flora Project 2011) lists the Sacramento Valley, northern San Joaquin Valley, central western California, South Coast, northern Channel Islands (i.e., Santa Cruz Island), western Transverse Range, and the Peninsular Ranges as the geographic regions in which round-leaved filaree occurs. While apparently well distributed in central and Northern California, it is very rare in Southern California (Reiser 2001). It is considered scarce and declining in western Riverside County (Roberts et al. 2004).

The CNDDB contains 142 records for round-leaved filaree in California, of which 12 are documented from Kern County (CDFG 2011a). All 12 occurrences in Kern County are considered extant. One occurrence is on the Wind Wolves Preserve, one on publicly held land, four are on private land, and ownership on the remaining six occurrences is unknown (CDFG 2011a). In Kern County, it is reported from the Temblor Range, the foothills east of Tehachapi, in the extreme southwestern Tehachapi Mountains along the northwest side of the desertous Antelope Valley, at Dry Bog Knoll, and at the head of Adobe Canyon in the Greenhorn foothills (Twisselmann 1967). Collections by Wiggins and Wolf from 1935 at the borders of Kern County have not been more recently verified (CDFG 2011a). A population of about 400 plants was reported in 2004 at Bodfish, south of Lake Isabella (CDFG 2011a).

Reasons for Decline

Overall threats to this species or reasons for decline include urbanization, habitat alteration, vehicles, pipeline construction, feral pigs, non-native plants, and, potentially, grazing (CNPS 2010). The loss of this species' friable clay microhabitat is another factor that may account for its limited distribution in Southern California (Reiser 1994).

5.3.3.2 HABITAT CHARACTERISTICS AND USE

In general, round-leaved filaree is found in open sites on clay soils in cismontane woodland and valley and foothill grasslands below 4,000 feet amsl (CNPS 2010; Jepson Flora Project 2011). Most verified reports in the CNDDB (CDFG 2011a) are from annual grasslands with a mixture of non-native grasses and native forbs. Blue oak woodland is the only type of woodland associated with round-leaved filaree populations in the CNDDB (CDFG 2011a). Wind Wolves Preserve (formerly San Emigdio Ranch) in Kern County has two metapopulations reported in blue oak woodlands (CDFG 2011a).

The Bodfish Canyon population near Lake Isabella occurs on open, red clay soils in vegetation dominated by blue oak and California juniper. Woolly fish-hooks (*Ancistrocarphus filagineus*), Pringle's yampah (*Perideridia pringlei*), common goldenstar (*Bloomeria crocea*), and cupleaf ceanothus (*Ceanothus greggii*) were also present in this habitat dominated by native plants

(CDFG 2011a). Gillespie (2003) found that bare ground occupied from 16% to 89% of the five sites examined, with the largest populations (approximately 700 and 1,000) occurring in areas with the most non-native grasses (21% and 39%, respectively).

Within annual grassland habitats, associated species recorded from collections from Los Angeles and Kern Counties include native species such as fascicled tarweed (*Deinandra fasciculata*), blue dicks (*Dichelostemma capitatum*), short-podded lotus (*Lotus humistratus*), dwarf plantain (*Plantago erecta*), Palmer's rabbitbrush (*Ericameria palmeri* ssp. *pachylepis*), blow-wives (*Achyrachaena mollis*), woolly fish-hooks, California goldfields (*Lasthenia californica*), and tidy-tips (*Layia platyglossa*) (CDFG 2011a). Non-natives include tocalote (*Centaurea melitensis*), red-stem filaree (*Erodium cicutarium*), wild oats (*Avena* sp.), and soft chess (*Bromus hordeaceus*) (CDFG 2011a).

As described in Section 5.3.3.3, during surveys on portions of Covered Lands, round-leaved filaree was observed at elevations between 4,200 and 4,600 feet amsl (Dudek 2009; Intermap Technologies Inc. 2005); the majority of these occurrences are on rescue variant loam, which contains reddish-brown and reddish-yellow clay loam in the subsoil (USDA 1981). In the Covered Lands, this species is primarily associated with annual grasslands but is also found in blue oak woodland, scrub, and scrub oak chaparral (Dudek 2009; TRC 2007).

5.3.3.3 OCCURRENCE IN THE COVERED LANDS

Surveys for special-status plants, including round-leaved filaree, were conducted in successive years from 2003 through 2007 in the TMV Planning Area. The pre-2007 surveys covered the portion of the TMV Planning Area that was initially identified for impacts, and the 2007 survey covered the entire 28,253-acre TMV Planning Area, including proposed open space. Vollmar Consulting conducted plant surveys in 2003 and 2004 covering approximately 4,500 acres of the TMV Planning Area (Vollmar Consulting 2004). Jones and Stokes conducted plant surveys in 2005 and 2006 covering the areas within the TMV Planning Area previously surveyed by Vollmar Consulting and some additional portions of the site (Jones and Stokes 2006a, 2006b). See *Appendix D.1* for more detailed information on survey methods.

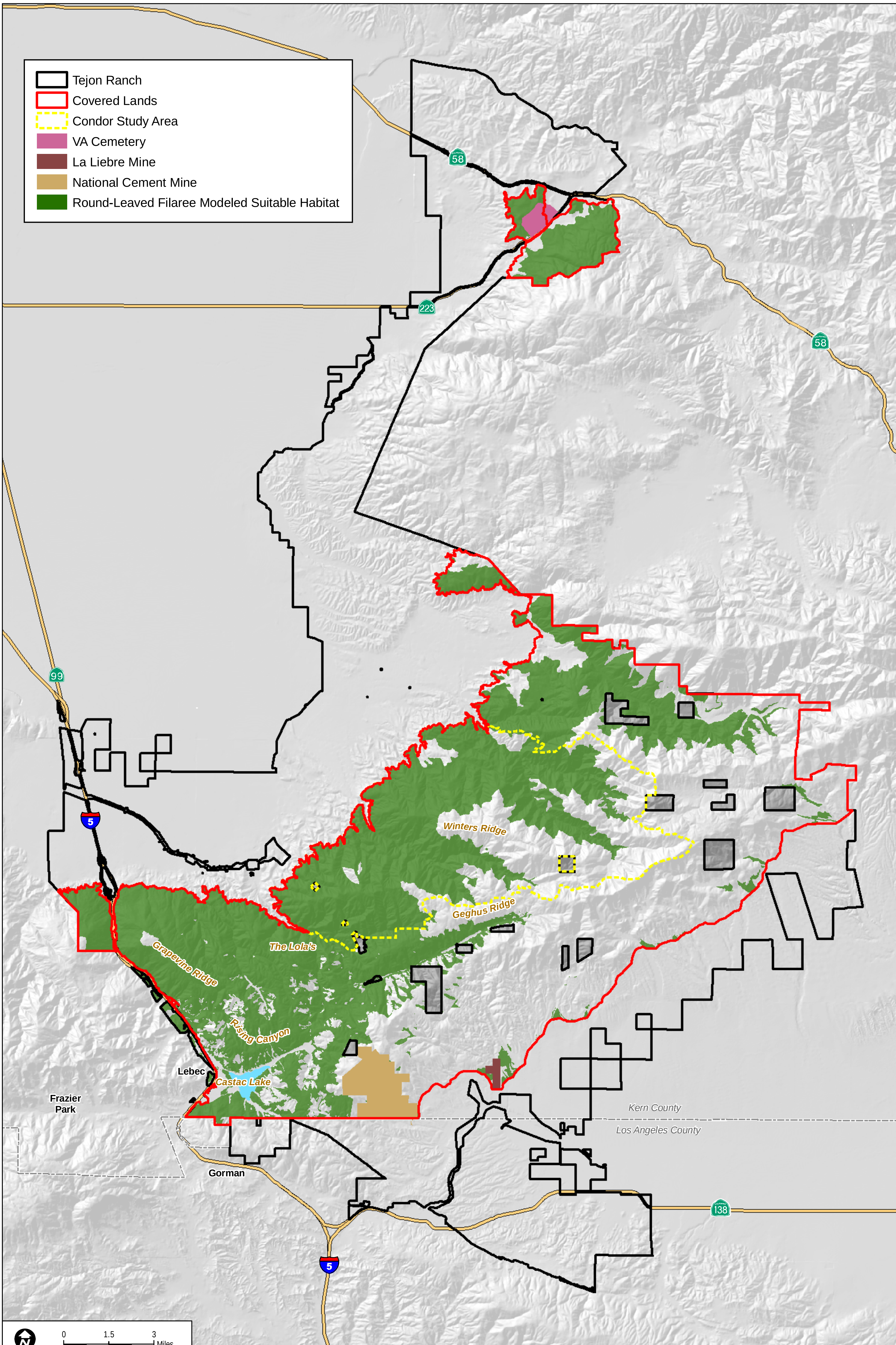
Dudek conducted the 2007 surveys and used data collected during these earlier surveys to prepare a target list of special-status plant species that could potentially occur (Dudek 2009). The data collected from these earlier surveys were also mapped on field maps used during the 2007 survey (Dudek 2009). Dudek also reviewed the online version of the CNPS Inventory of Rare and Endangered Plants (CNPS 2008) and conducted a CNPS nine-quad search for the Lebec, Pastoria Creek, Frazier Mountain, Grapevine, Winters Ridge, and La Liebre Ranch quadrangles. Other background sources for the special-status plant surveys included *Vascular Flora of the Liebre Mountains, Western Transverse Ranges, California* (Boyd 1999); *A Flora of Kern County* (Twisselman 1967); *The Jepson Manual: Higher Plants of California* (Hickman 1996); and *Soil Survey of Kern County, California, Southeastern Part* (Valverde and Hill 1981). Finally, Dudek compared elevation ranges (calculated from the DTM created in 2006 (Intermap Technologies 2005)) to known elevation ranges for the potentially occurring special-status plant species, such as round-leaved filaree.

In 2007, the Dudek-supervised botanical survey team conducted two passes of field surveys during the spring/early summer (April 16 through July 9, 2007), plus a third pass in mid-July and late September 2007 for late-blooming species (Dudek 2009). The botanical survey team spent a total of 748 person-days (approximately 7,476 hours), covering roughly 50 to 75 acres per week, conducting focused surveys for special-status plants, including the round-leaved filaree.

Round-leaved filaree was observed in the southeastern portion of the Covered Lands in 11 areas within the TMV Planning Area that supported approximately 430 to 730 individuals (Dudek 2007a), and it has moderate potential to occur elsewhere on unsurveyed portions of the Covered Lands. There are no other CNDDB records of round-leaved filaree in the Covered Lands; however, there is an occurrence approximately 2 miles south of the Covered Lands (CDFG 2011a).

Suitable habitat for this species was modeled on all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitats on Covered Lands are grassland, scrub, chaparral, woodland, savannah, conifer, and riparian woodland at elevations between 1,900 and 4,600 feet on clay soils. A version of the model was also run for areas in the western portion of Covered Lands that do not have soils data.

Modeled suitable habitat within Covered Lands for round-leaved filaree is shown in *Figure 5-25, Round-Leaved Filaree Modeled Suitable Habitat*. A total of 58,073 acres of suitable habitat for round-leaved filaree was modeled for Covered Lands with soils data, and 12,846 acres of suitable habitat were modeled on Covered Lands without soils data.



SOURCE: TRC 2007

FIGURE 5-25

Round-Leaved Filaree Modeled Suitable Habitat

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5.3.4 STRIPED ADOBE LILY

The striped adobe lily (*Fritillaria striata*) is a slender, bulbous perennial in the lily family (*Liliaceae*). It is usually between 14 and 15 inches (35 and 38 centimeters) tall and has three to 10 alternate oblong-ovate leaves that are 2 to 3 inches (6 to 7 centimeters) long (Hickman 1996); therefore, this species is moderately visible on foot. Each plant has one to four nodding, white-to-pink, bell-shaped flowers with burgundy stripes (CDFG 2000b; Hickman 1996), with large green-striped, concave, elliptical-to-ovate nectaries (0.12 by 0.04 inch (3 by 2 millimeters)) (Stebbins 1989). The plant's spherical bulb is found 8 to 13 inches (20 to 35 centimeters) underground and is 0.6 to 0.8 inch (15 to 20 millimeters) in diameter. The striped adobe lily differs from the related adobe lily (*F. pluriflora*) in its conspicuous nectaries and converging stigmas, as well as the shape, size, and coloring of its flowers (Stebbins 1989).

5.3.4.1 STATUS AND DISTRIBUTION

Regulatory History

The striped adobe lily has no Federal designation but has been listed in California as threatened since 1987. The striped adobe lily is also a CRPR 1B.1 species, and is considered seriously endangered in California (CDFG 2011d). The striped adobe lily has a California Heritage Element Ranking of S2, indicating a very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation from the state (CDFG 2011c).

Natural History

Observations suggest that the vegetation and reproductive phenology of this plant are correlated with rainfall patterns. The species grows (vegetatively) slowly from November through January. The size and total number of flowers per plant are greatly affected by the amount and timing of winter rains (Stebbins 1989). Flowering is positively correlated with elevation, exposure, and soil moisture levels. The striped adobe lily typically blooms between February and April, and blooming periods are longer in years with more spring rain. The striped adobe lily disperses its seeds via dehiscent[15] capsules (Hickman 1996) between mid-April and late May (Stebbins 1989).

According to Stebbins (1989), no striped adobe lily seedlings have been reported, suggesting that reproduction may primarily be vegetative, which would also account for the species' limited distribution. However, the reproductive ecology and specific pollinating mechanisms of striped adobe lily are not understood and further studies are recommended. Stebbins suggests that the pollination ecology of striped adobe lily may be similar to other members of the lily family in the region (Stebbins 1989). According to Tamura, *Fritillaria* spp. with large nectaries[16] are typically

[15] "Dehiscent" means opening at maturity.
[16] Large nectaries are 0.2 to 0.5 inch (4 to 12 millimeters) by 0.04 to 0.2 inch (1 to 4 millimeters) (Tamura 1998).

pollinated by wasps, and *Fritillaria* spp. with normal-sized nectaries[17] are typically pollinated by bumblebees (Tamura 1998); striped adobe lily nectaries are considered large according to the measurements established by Tamura (1998).

Distribution and Population Trends

The striped adobe lily is endemic to the southern Sierra Nevada foothills of eastern Tulare and Kern Counties (CDFG 2000b). The Jepson Online Interchange for California Floristics (Jepson Flora Project 2011) lists the southern Sierra Nevada, especially the Greenhorn Mountains, as the geographic region in which striped adobe lily occurs. At least 23 extant populations of this species are known (CDFG 2007b). It is reported from nine USGS quadrangles: Tejon Ranch, Rio Bravo Ranch, Democrat Hot Springs, Sand Canyon, Pine Mountain, Frazier Valley, Success Dam, Lindsay, and Porterville (CNPS 2008). Collections of this plant have been made from Kern County (SMASCH 2007).

The CNDDB contains 23 records for striped adobe lily in California (CDFG 2011a), 16 of which are from Kern County. Fifteen of the populations from Kern County occur on private land and the land ownership of the other is unknown. All but one of the Kern County occurrences are considered extant. The striped adobe lily is reported from various places throughout the county, including the Greenhorn Mountains, along Rancheria Road, and in the Tejon Hills. The three Tejon Hills records are in the northern portion of Covered Lands.

As of 1999, the population status of striped adobe lily was unknown due to the fact that many of the populations occur on private lands and census data are not available. According to the CDFG (CDFG 2000b), controversy has surrounded the status of this species since it was proposed for Federal listing as threatened in 1994. Official tabulations of the number and size of populations have been disputed by ranchers and landowners. Results from field surveys supported by landowners provide population estimates much in excess of previous estimates. Claims have also been made that many additional populations exist, but as of 2000, documentation of population numbers and new occurrences had not been shared with USFWS or reported to the CNDDB (CDFG 2000b). Despite the controversy regarding population information, according to the Striped Adobe Lily Species Management Plan (CDFG 2000b), at least four populations of striped adobe lily are known to have been extirpated when their habitat was converted to agricultural lands. Three more populations at lower elevations on the slopes of Lewis Hill near Frazier Valley are threatened by expansion of citrus orchards (CDFG 2000b).

This lack of data has constrained resource agencies from making informed decisions about the status of the striped adobe lily (CDFG 2000b). In 1998, USFWS withdrew the proposal to list the

[17] Small nectaries are 0.1 to 0.4 inch (2 to 10 millimeters) by 0.04 to 0.1 inch (1 to 2 millimeters) (Tamura 1998).

striped adobe lily as threatened (63 FR 177). The striped adobe lily remains listed as threatened by the State of California.

Reasons for Decline

The striped adobe lily is threatened by agriculture, urbanization, road maintenance activities, and non-native plants (CNPS 2008; CDFG 2000b). According to CDFG, heavy grazing has also directly negatively impacted some populations (CDFG 2000b); however, the impact of grazing on the lily is not understood (Stebbins 1989). In the range of the striped adobe lily, heavily grazed lands often support large populations of California ground squirrels (*Spermophilus beecheyi*), burrowing rodents that eat the bulbs of perennials such as brodiaeas (*Brodiaea* spp.), soap plant (*Chlorogalum* sp.), mariposa lilies (*Calochortus* spp.), and presumably fritillaries (*Fritillaria* spp.) (Stebbins 1989). Some ranchers have questioned whether grazing is truly harmful to the species, since most remaining populations occur on ranch lands that have been grazed for many decades (CDFG 2000b). The timing and intensity of grazing appear to be significant, and light grazing and avoidance during the flowering and seed production period may actually benefit the species (CDFG 2000b; Stebbins 1989). Stebbins (1989) suggests that striped adobe lily may benefit from light to moderate levels of grazing prior to early to mid-February (but after seed dispersal) due to the effects that grazing has on reducing non-native competitors, such as non-native annual grasses.

5.3.4.2 HABITAT CHARACTERISTICS AND USE

The striped adobe lily occurs in cismontane woodland and in valley and foothill grassland habitats (CDFG 2007b). More specifically, it has been documented in blue oak woodland and non-native grassland habitats (63 FR 177). Striped adobe lily is restricted to heavy, usually red, clay soils, but the physiological and/or ecological basis for this restriction is not known (Stebbins 1989). Populations of striped adobe lily typically occur on the lower portions of north-facing (0 to 90 degrees and 0 to 270 degrees) slopes (Stebbins 1989) between 443 and 4,774 feet amsl (135 and 1,455 meters) in elevation.

Most of the verified reports in the CNDDB (CDFG 2007b) are from annual grasslands with a mixture of non-native grasses and native forbs. At least two documented occurrences of striped adobe lily are from oak woodlands and one record is from a native perennial grassland.

The largest documented population of striped adobe lily occurs in Kern County about 1 mile northeast of Long Tom Mine in the Pine Mountain USGS quadrangle. About 100,000 individuals were documented in this population in 1990, and densities near the center of the occurrence ranged from five to nine plants per square foot between 1998 and 2001 (CDFG 2007b). The population occurs on private property in oak woodland on heavy clay soils. Other plants associated with this population include filaree (*Erodium* sp.), lomatium (*Lomatium* sp.), soap plant, peppergrass (*Lepidium* sp.), snakelily (*Dichelostemma* sp.), miner's lettuce (*Montia* sp.), fiddleneck (*Amsinckia* sp.), and buttercup (*Ranunculus* sp.).

5.3.4.3 OCCURRENCE IN THE COVERED LANDS

Surveys for special-status plants, including striped adobe lily, were conducted in successive years from 2003 through 2007 in the TMV Planning Area. The pre-2007 surveys covered the portion of the TMV Planning Area that was initially identified for impacts, and the 2007 survey covered the entire 28,253-acre TMV Planning Area, including proposed open space. Vollmar Consulting conducted plant surveys in 2003 and 2004 covering approximately 4,500 acres of the TMV Planning Area (Vollmar Consulting 2004). Jones and Stokes conducted plant surveys in 2005 and 2006 covering the areas within the TMV Planning Area previously surveyed by Vollmar Consulting and some additional portions of the site (Jones and Stokes 2006a, 2006b). In 2011, Dudek conducted a focused survey for striped adobe lily in the Beartrap Turnout Improvement Project study area (Dudek 2011b). See *Appendix D.1* for more detailed information on survey methods.

Dudek conducted the 2007 surveys and used data collected during these earlier surveys to prepare a target list of special-status plant species that could potentially occur (Dudek 2009). The data collected from these earlier surveys were also mapped on field maps used during the 2007 survey (Dudek 2009). Dudek also reviewed the online version of the CNPS Inventory of Rare and Endangered Plants (CNPS 2008) and conducted a CNPS nine-quad search for the Lebec, Pastoria Creek, Frazier Mountain, Grapevine, Winters Ridge, and La Liebre Ranch quadrangles. Other background sources for the special-status plant surveys included *Vascular Flora of the Liebre Mountains, Western Transverse Ranges, California* (Boyd 1999); *A Flora of Kern County* (Twisselman 1967); *The Jepson Manual: Higher Plants of California* (Hickman 1996); and *Soil Survey of Kern County, California, Southeastern Part* (Valverde and Hill 1981). Finally, Dudek compared elevation ranges (calculated from the DTM created in 2006 (Intermap Technologies 2005)) to known elevation ranges for the potentially occurring special-status plant species, such as striped adobe lily.

In 2007, the Dudek-supervised botanical survey team conducted two passes of field surveys during the spring/early summer (April 16 through July 9, 2007), plus a third pass in mid-July and late September 2007 for late-blooming species (Dudek 2009). The botanical survey team spent a total of 748 person-days (approximately 7,476 hours), covering roughly 50 to 75 acres per week, conducting focused surveys for special-status plants, including the striped adobe lily.

Striped adobe lily was not observed in the TMV Planning Area during the surveys conducted in 2007 or during other floristic surveys conducted on site from 2003 to 2006. However, striped adobe lily was observed in 2007 at a reference location on Covered Lands in the Old Headquarters area just prior to surveys conducted in the TMV Planning Area, so environmental conditions in 2007 were appropriate for the aboveground growth of this species (Enright, pers. comm. 2011).

On April 28, 2011, a focused survey for striped adobe lily was conducted in the Beartrap Turnout Improvement Project study area. Prior to conducting the survey, a reference population of a CNDDB record (Occurrence No. 18) (CDFG 2011a) located in the Old Headquarters area of Tejon Ranch was conducted to confirm the species was blooming and visible at the time the survey was conducted. Several striped adobe lily individuals were observed in bloom and clearly visible. No striped adobe lily was detected in the Beartrap Turnout Improvement Project study area during this study (Dudek 2011b).

There are three CNDDB records of striped adobe lily near Tejon Hills, in the northern portion of Covered Lands in the Old Headquarters area (CDFG 2011a). The 2007 reference survey found the species at one of two CNDDB occurrence sites (Element Occurrence (EO) 18, but not at EO19) (Enright, pers. comm. 2011); however EO 19 and EO 20 were occupied in 2009 (CDFG 2011a).

Suitable habitat for this species was modeled on all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitat on Covered Lands are oak woodlands and forests with less than 40% cover and native and non-native grassland communities on clay soils at elevations between 1,900 and 4,800 feet. A version of the model was also run for areas in the western portion of Covered Lands that do not have soils data.

Modeled suitable habitat within Covered Lands for striped adobe lily is shown in *Figure 5-26, Striped Adobe Lily Modeled Suitable Habitat*. A total of 32,213 acres of suitable habitat for striped adobe lily was modeled for Covered Lands with soils data, and 9,735 acres of suitable habitat were modeled on Covered Lands without soils data. However, because of the negative survey results within the TMV Planning Area, it is unlikely that all modeled suitable habitat within Covered Lands would be saturated, and because it is assumed that some modeled suitable habitat may not contain the microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species.

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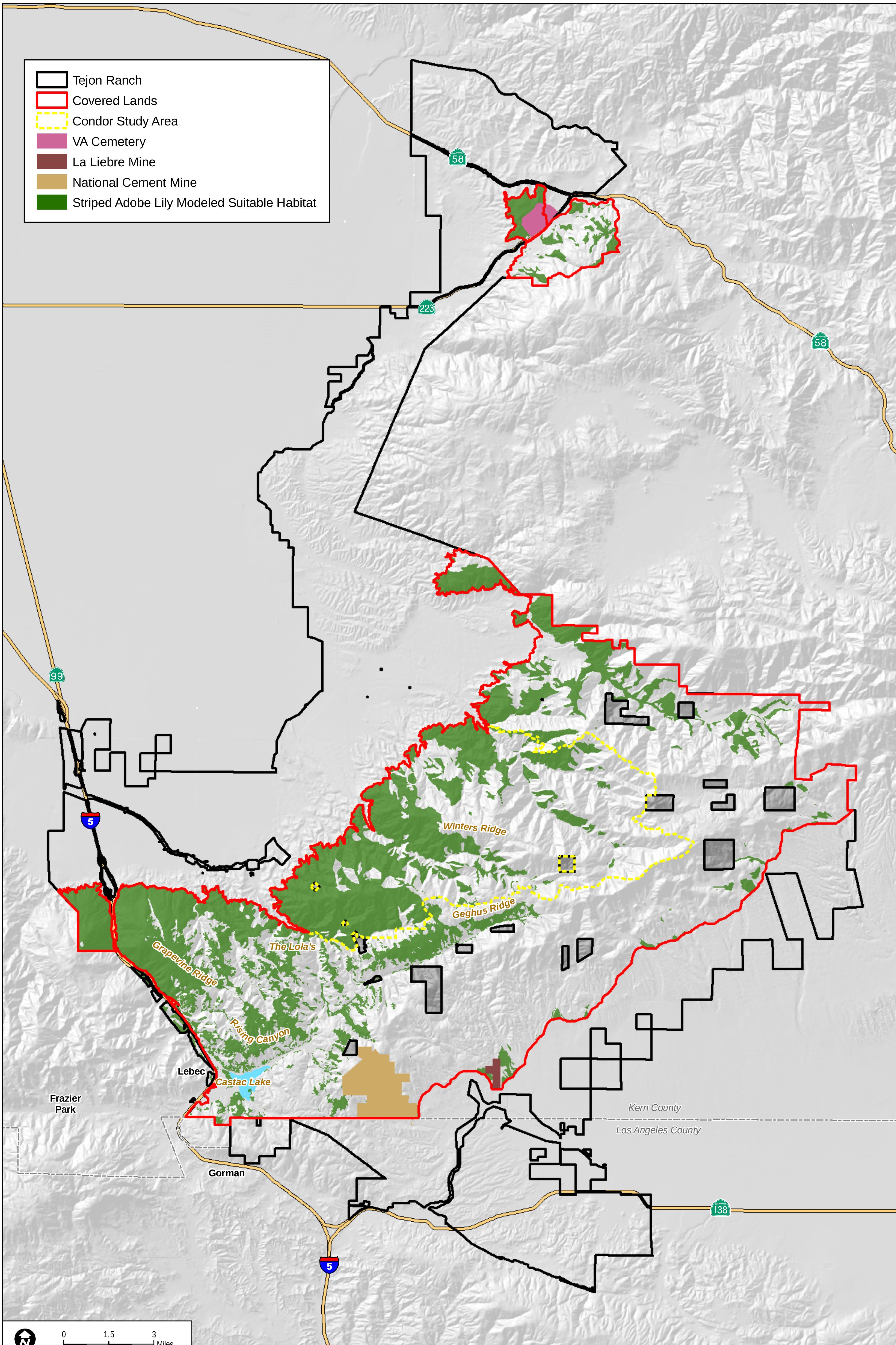

SOURCE: TRC 2007

FIGURE 5-26

Striped Adobe Lily Modeled Suitable Habitat

Draft Tehachapi Uplands MSHCP

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5.3.5 TEHACHAPI BUCKWHEAT

Tehachapi buckwheat (*Eriogonum callistum*) is a newly described perennial in the Buckwheat family (*Polygonaceae*). Individuals arise from a woody taproot[18], forming compact, rounded, subshrubs about 1 to 3 feet (0.3 to 1.0 meter) across and 4 to 14 inches (10 to 35 centimeters) tall (Reveal 2006a). The leaves of Tehachapi buckwheat are 1 to 2 inches (2 to 5 centimeters) long and silky grayish-white tomentose (densely covered with short, matted, wooly hairs) on both surfaces. Each capitate[19] inflorescence is 1 to 2 inches (2 to 4 centimeters) in diameter and typically contains 10 to 25 pinkish-white buds that will become bright white flowers. The flowers are densely white tomentose with long, soft hairs and rosy to yellowish-green midribs[20] on the petals (Reveal 2006a).

Tehachapi buckwheat is a new species and the sole representative of a new section *Lanocephala* within the subgenus *Eucycla* in the genus *Eriogonum*. This new section is allied to the *Lachnogyna* section, which is found in the Great Plains, but could probably be more closely related to section *Latifolia* of the Pacific Coast. It is specifically similar to coast buckwheat (*Eriogonum latifolium*) because both species form rounded mounds of leaves and have numerous involucres[21] in capitate heads (Reveal 2006a). However, coast buckwheat is a shrub or subshrub with long, aboveground woody stems, while Tehachapi buckwheat is a herbaceous perennial with short, stout, caudex[22] branches (Reveal 2006a). Molecular studies are recommended to resolve the exact placement of this new section Lanocephala (Reveal 2006a).

5.3.5.1 STATUS AND DISTRIBUTION

Regulatory History

Tehachapi buckwheat does not have Federal or state status, but has been recognized as a special-status species by CNDDB and added to the database (CDFG 2011d). Tehachapi buckwheat is also a CRPR 1B.1 species, and is considered seriously endangered in California (CDFG 2011a). Tehachapi buckwheat was first described in 2006 (Reveal 2006a). The Tehachapi buckwheat has a California Heritage Element Ranking of S1, indicating it is critically imperiled in the state because of extreme rarity (often five or fewer occurrences) or because of some factor(s), such as very steep declines, making it especially vulnerable to extirpation from the state (CDFG 2011d).

[18] "Taproot" refers to the main root axis of a plant.
[19] "Capitate" means in a head-shaped cluster.
[20] "Midrib" refers to the central rib or vein.
[21] "Involucres" are whorls of bracts (leaf-like structures) at the base of a flower or flower cluster.
[22] "Caudex" refers to the sustained and typically woody base of a herbaceous perennial.

Natural History

Tehachapi buckwheat flowers from late spring through summer (Reveal 2006b). Observations of Tehachapi buckwheat during 2007 surveys[23] suggest the plant may be pollinated by a variety of beetles and ants; butterflies may not be important pollinators due to the lack of butterfly species visiting the plants during peak phenology (i.e., June and July) in 2007 (Dudek 2009). Based upon pollination syndromes (Howe and Westley 1988; USFS 2008) and site observations (Dudek 2009), it is more likely that this species is pollinated by beetles and ants, but no data is available regarding pollinators for this species. Very little else is known about the natural history of this species. Dispersal information is not available for this species but Stokes (1936) found that *Eriogonum* spp. seeds are dispersed by animals, streams, wind, and rain.

Distribution and Population Trends

The only known occurrences of the Tehachapi buckwheat are those observed during the special-status plant surveys in the TMV Planning Area on Covered Lands (Dudek 2009). This species was first observed during the special-status plant surveys conducted by Jones and Stokes (2006a). The population of Tehachapi buckwheat in the TMV Planning Area appears to be stable and experiencing few threats at this time, so known population trends are not detectable at this time.

Reasons for Decline

There are no documented threats to Tehachapi buckwheat because the species was first described in 2006 and scientific literature on the species has been limited. However, threats have been documented to Kern buckwheat (*Eriogonum kennedyi* var. *pinicola*) and cushenberry buckwheat (*Eriogonum ovalifolium* var. *vineum*), which are, like Tehachapi buckwheat, perennial cushion-form buckwheat species and narrow endemics. Cushenberry buckwheat and Kern buckwheat are CNPS List 1B.1 species. Cushenberry buckwheat is also Federally endangered.

Threats to cushenberry buckwheat and Kern buckwheat include over-grazing, limestone mining, urbanization/construction, road maintenance activities, competition from non-native plants (especially tall species that shade individuals), and changes in hydrology (CNPS 2010; Center for Plant Conservation 2008; Sanders 2008). With the exception of over-grazing, these threats may be applicable to Tehachapi buckwheat occurrences in the Covered Lands as well. Grazing is of limited concern because the species occurs in rocky openings in chaparral where cattle are not grazed regularly.

Kern buckwheat appears to be intolerant of excessive shading. According to Sanders (2008), this species is "very competitive on sites where tall and fast-growing species are excluded by

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[23] Surveys conducted in 2007 (Dudek 2009) were not pollinator studies but surveys intended to inventory for invertebrates, primarily butterflies.

moisture deficiencies, wind, and winter cold." In addition, the wool on the leaf surface of Kern buckwheat indicates that the species is better adapted to conserve water because the wool creates a layer of air that minimizes water loss due to wind (Sanders 2008). Tehachapi buckwheat also has a thick layer of wool on its leaf surface. It is likely that increases in water supply to areas where Tehachapi buckwheat occurs could therefore reduce Tehachapi buckwheat's competitive advantage, thus favoring the growth of competing non-native plant species that could crowd and shade Tehachapi buckwheat, further limiting its success.

Limestone mining also may pose a threat to Tehachapi buckwheat because it fragments habitat, alters hydrology, and can increase airborne particulate matter that can interfere with the success of pollinators in the area. The particulates can also create a hardened layer on the soil that inhibits light and water penetration and reproductive success of plants in the area (Center for Plant Conservation 2008). Tejon leases land for limestone and aggregate mining in the south–central portion of the Covered Lands, near the Tehachapi buckwheat occurrences. However, prevailing wind patterns are usually from south and west to north and east in this general area of California (USDHHS 2008), positioning the Tehachapi buckwheat populations upwind from the mine lease site.

In addition to the threats above, it is possible that invasive ants may be a threat to Tehachapi buckwheat. Invasive ants, including Argentine ants, may become abundant within their introduced range and may drive out or kill native ants of a newly invaded territory (Holway et al. 2002a; Suarez et al. 1998). This displacement of native ants is the most obvious and widely reported effect of non-native ants and may cause as high as 90% or more reduction of native ant abundance (Holway et al. 2002a). Ant–plant "mutualisms" or relationships include tending, seed dispersal, and interactions with flowers (Holway et al. 2002a). If native ants that carry out these functions are replaced by non-native ants that may or may not fulfill any or all of these functions, the reproductive cycle of the plant may be disrupted.

5.3.5.2 HABITAT CHARACTERISTICS AND USE

During various surveys conducted in portions of the Covered Lands (see Section 5.3.5.3), Tehachapi buckwheat was observed on limestone between 4,400 and 5,410 feet amsl in elevation (Dudek 2009; Intermap Technologies Inc. 2005). The majority of these plants were observed in openings in chaparral on gravelly loam or rock outcrop complex (Dudek 2009; USDA 1981). In the Covered Lands, this species is primarily associated with chaparral dominated by Parry manzanita (*Arctostaphylos parryana*). It is less often associated with pinyon pine woodlands and chaparral dominated by chamise (*Adenostoma fasciculatum*) (Dudek 2009, 2007c). Other associated species include Utah service-berry (*Amelanchier utahensis*), chaparral yucca (*Yucca whipplei*), and scrub oak.

5.3.5.3 OCCURRENCE IN THE COVERED LANDS

Surveys for special-status plants, including Tehachapi buckwheat, were conducted in successive years from 2003 through 2007 in the TMV Planning Area. The pre-2007 surveys covered the portion of the TMV Planning Area that was initially identified for impacts, and the 2007 survey covered the entire 28,253-acre TMV Planning Area, including proposed open space. Vollmar Consulting conducted plant surveys in 2003 and 2004 covering approximately 4,500 acres of the TMV Planning Area (Vollmar Consulting 2004). Jones and Stokes conducted plant surveys in 2005 and 2006 covering the areas within the TMV Planning Area previously surveyed by Vollmar Consulting and some additional portions of the site (Jones and Stokes 2006a, 2006b). See *Appendix D.1* for more detailed information on survey methods.

Dudek conducted the 2007 surveys and used data collected during these earlier surveys to prepare a target list of special-status plant species that could potentially occur (Dudek 2009). The data collected from these earlier surveys were also mapped on field maps used during the 2007 survey (Dudek 2009). Dudek also reviewed the online version of the CNPS Inventory of Rare and Endangered Plants (CNPS 2008) and conducted a CNPS nine-quad search for the Lebec, Pastoria Creek, Frazier Mountain, Grapevine, Winters Ridge, and La Liebre Ranch quadrangles. Other background sources for the special-status plant surveys included *Vascular Flora of the Liebre Mountains, Western Transverse Ranges, California* (Boyd 1999); *A Flora of Kern County* (Twisselman 1967); *The Jepson Manual: Higher Plants of California* (Hickman 1996); and *Soil Survey of Kern County, California, Southeastern Part* (Valverde and Hill 1981). Finally, Dudek compared elevation ranges (calculated from the DTM created in 2006 (Intermap Technologies 2005)) to known elevation ranges for the potentially occurring special-status plant species, such as Tehachapi buckwheat.

In 2007, the Dudek-supervised botanical survey team conducted two passes of field surveys during the spring/early summer (April 16 through July 9, 2007), plus a third pass in mid-July and late September 2007 for late-blooming species (Dudek 2009). The botanical survey team spent a total of 748 person-days (approximately 7,476 hours), covering roughly 50 to 75 acres per week, conducting focused surveys for special-status plants, including the Tehachapi buckwheat.

In 2007, 500 to 600 Tehachapi buckwheat individuals were documented in the Poleline Ridge area within the TMV Planning Area and on Covered Lands adjacent to the southern edge of the TMV Planning Area. Occurrences were on limestone, and the majority of individuals were observed on rock outcrops primarily at elevations from 4,800 to 5,000 feet. Some individuals were found between 4,600 and 4,800 feet, and few individuals were found in the ranges of 4,400 to 4,600 feet or 5,200 to 5,400 feet. All occurrences were on north-facing slopes between 15 and 45 degrees.

There are no other CNDDB records of Tehachapi buckwheat in the Covered Lands or elsewhere (CDFG 2011a).

Suitable habitat for this species was modeled on all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitats on Covered Lands are chaparral and woodland at elevations between 4,400 and 5,500 feet and on suitable soils, including Anaverde gravelly loam, Lebec rocky loam, and Xerorthents-Rock Outcrop complex. A version of the model was also run for areas in the western portion of Covered Lands that do not have soils data.

Modeled suitable habitat within Covered Lands for Tehachapi buckwheat is shown in *Figure 5-27*, *Tehachapi Buckwheat Modeled Suitable Habitat*. A total of 2,579 acres of suitable habitat for Tehachapi buckwheat was modeled for Covered Lands with soils data, and 10 acres of suitable habitat were modeled on Covered Lands without soils data.

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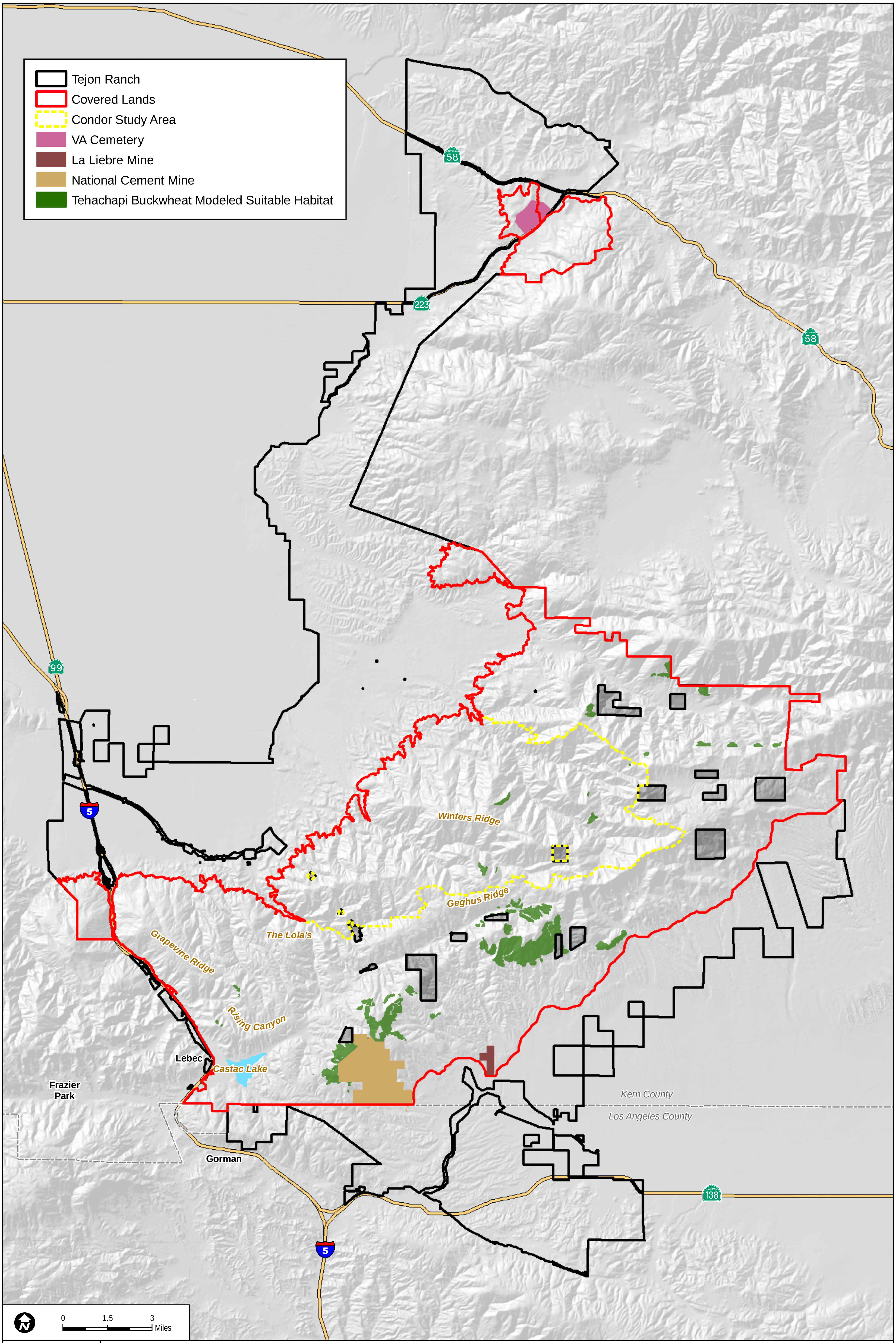

SOURCE: TRC 2007

FIGURE 5-27

Tehachapi Buckwheat Modeled Suitable Habitat

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5.3.6 TEJON POPPY

Tejon poppy (*Eschscholzia lemmonii* ssp. *kernensis*) is an annual herb in the Poppy family (*Papaveraceae*). It was originally named *Eschscholzia caespitosa* ssp. *kernensis*, but was renamed in 1986 because it had more characteristics in common with Lemmon's poppy *(E. lemmonii* ssp. *lemmonii)* than with tufted poppy *(E. caespitosa)* (Cypher 2006). Tejon poppy is 2 to 12 inches (5 to 30 centimeters) tall with deeply dissected leaves and orange or deep yellow flowers. The showy flower petals on this species are 1 to 2 inches (2 to 4 centimeters) long (Hickman 1996). The elongate, cylindrical fruit contains tiny, bur-like seeds. Unlike California poppy (*E. californica*), Tejon poppy lacks a conspicuous receptacle rim beneath the flower. Tejon poppy can be differentiated from Lemmon's poppy by its erect, glabrous buds. Tejon poppy has smoother seeds and larger, darker flowers than tufted poppy (Cypher 2006).

5.3.6.1 STATUS AND DISTRIBUTION

Regulatory History

Tejon poppy has no Federal designation, but it is a CRPR 1B.1 species, considered seriously endangered in California (CDFG 2011d). The Tejon poppy has a California Heritage Element Ranking of S1, indicating it is critically imperiled in the state because of extreme rarity (often five or fewer occurrences) or because of some factor(s), such as very steep declines, making it especially vulnerable to extirpation from the state (CDFG 2011d).

Natural History

Tejon poppy is an annual and flowers from March to May (CNPS 2008). It is normally scarce, but it can grow in dense colonies in wet years. In certain areas, Tejon poppy is present in all but the driest years (Twisselmann 1967). Tejon poppy has small, bur-like seeds, and the capsules (i.e., seed-bearing fruit) of plants in the genus *Eschscholzia* are septicidal and described as being "explosively xerochastic," (Clark and Jernstedt 1978). "Xerochastic" describes the manner in which capsules open along the seams of the fruit (i.e., septicidal) as it dehisces (discharges contents by splitting along a natural line). Explosive dehiscence provides short-distance dispersal, but in an extensive study of seed and seed coat morphology, Clark and Jernstedt (1978) observed that seeds in many species of *Eschscholzia,* including *E. lemmonii,* appear to be adapted for runoff dispersal that can occur over greater distances. Various aspects of the seed morphology allow the seed to float and, therefore, allow for dispersal to occur via runoff. Specific details regarding the life history of Tejon poppy are not known (Cypher 2006).

Distribution and Population Trends

Tejon poppy is endemic to central and western Kern County. The Jepson Online Interchange for California Floristics (Jepson Flora Project 2011) lists the southwest Tehachapi Mountain Area and northern Western Transverse Ranges as the geographic regions in which Tejon poppy occurs. Tejon poppy is reported from 17 USGS quadrangles: Grapevine, Bear Mountain, Tejon Ranch, Arvin, Tejon Hills, Coal Oil Canyon, Taft, Maricopa, Fellows, Panorama Hills, Bena, East Elk Hills, Tupman, Reward, West Elk Hills, Pine Mountain, and Pleito Hills (CNPS 2008; CDFG 2007b). Collections of this plant have been made from Kern County (SMASCH 2007).

The CNDDB includes 58 occurrences of this species (CDFG 2011a), all of which are assumed to be extant. Tejon poppy is known to be extant in Elk Hills, but populations documented in older literature reports and collections from Comanche Point, Tejon Hills, Dry Bog Knoll in the Greenhorn Range foothills, near the mouth of Salt Creek, south of Maricopa near Devil's Gulch, and in the mesas east of Bakersfield have not been revisited in three or more decades (CDFG 2007b; Twisselmann 1967; Cypher 2006). Habitats in these areas have not been altered significantly, so these populations are assumed to be extant (Cypher 2006).

Most of the occurrences are on private property, but several are on lands owned by the Department of Energy (DOE) or Bureau of Land Management in Elk Hills. The vast majority of the occurrences of Tejon poppy in Elk Hills, however, are on lands owned by Occidental Petroleum (CDFG 2007b). Ownership on six occurrences, including most of the occurrences documented before 1970, is not known.

Tejon poppy has always been rare due to its restricted range and affinity for clay soils (Cypher 2006). In 1997, the DOE sponsored floristic surveys in Elk Hills that led to the discovery of four colonies of Tejon poppy. Continued surveys at Elk Hills sponsored by Occidental Petroleum may reveal additional populations in the area (Cypher 2006). No populations of Tejon poppy are known to have been extirpated, so the status of this species is assumed to be stable.

Reasons for Decline

The Tejon poppy is threatened by oilfield development and related petroleum production activities in Elk Hills (CDFG 2007b). Tejon poppy may also be threatened by grazing and competition from non-native plants (CNPS 2010) and competition with non-native plants (Cypher 2006).

5.3.6.2 HABITAT CHARACTERISTICS AND USE

Tejon poppy occurs in chenopod scrub and in valley and foothill grassland habitats (CDFG 2007b). More specifically, it has been documented in valley saltbush scrub and non-native grassland habitats (CDFG 2007b). Tejon poppy grows on clay soils (Cypher 2006; CDFG 2007b; Twisselmann 1967) and in sandy soils (CDFG 2007b) between 525 and 3,280 feet amsl (160 and 1,000 meters) in elevation (CNPS 2008). Populations typically occur on south-facing slopes that are often steep (CDFG 2007b).

Most of the verified reports of Tejon poppy in the CNDDB (CDFG 2007b) from Elk Hills are from valley saltbush scrub, with common saltbush (*Atriplex polycarpa*) and non-native annual grasses, such as red brome (*Bromus madritensis* ssp. *rubens*), wild oats (*Avena fatua*), and rat-tail fescue (*Vulpia myuros*). Spiny saltbush (*Atriplex spinifera*) is also listed as an associate of Tejon poppy in these areas. In the 1960s, associates of Tejon poppy recorded at Comanche Point included Kern brodiaea (*Brodiaea terrestris* ssp. *kernensis*), sunset lupine (*Lupinus microcarpus* var. *horizontalis*), and Comanche Point layia (*Layia leucopappa*) (Cypher 2006).

Because there are no known occurrences of Tejon poppy in the Covered Lands based upon a literature review (CDFG 2011a), and because the species was not observed during surveys conducted in a portion of the Covered Lands (see Section 5.3.6.3), a specific description of habitat used by this species in the Covered Lands is not available. However, it is assumed that Tejon poppy could potentially occur within portions of the Covered Lands where modeled suitable habitat is present.

5.3.6.3 OCCURRENCE IN THE COVERED LANDS

Surveys for special-status plants, including Tejon poppy, were conducted in successive years from 2003 through 2007 in the TMV Planning Area. The pre-2007 surveys covered the portion of the TMV Planning Area that was initially identified for impacts, and the 2007 survey covered the entire 28,253-acre TMV Planning Area, including proposed open space. Vollmar Consulting conducted plant surveys in 2003 and 2004 covering approximately 4,500 acres of the TMV Planning Area (Vollmar Consulting 2004). Jones and Stokes conducted plant surveys in 2005 and 2006 covering the areas within the TMV Planning Area previously surveyed by Vollmar Consulting and some additional portions of the site (Jones and Stokes 2006a, 2006b). See *Appendix D.1* for more detailed information on survey methods.

Dudek conducted the 2007 surveys and used data collected during these earlier surveys to prepare a target list of special-status plant species that could potentially occur (Dudek 2009). The data collected from these earlier surveys were also mapped on field maps used during the 2007 survey (Dudek 2009). Dudek also reviewed the online version of the CNPS Inventory of Rare and Endangered Plants (CNPS 2008) and conducted a CNPS nine-quad search for the Lebec, Pastoria Creek, Frazier Mountain, Grapevine, Winters Ridge, and La Liebre Ranch quadrangles. Other background sources for the special-status plant surveys included *Vascular Flora of the Liebre Mountains, Western Transverse Ranges, California* (Boyd 1999); *A Flora of Kern County* (Twisselman 1967); *The Jepson Manual: Higher Plants of California* (Hickman 1996); and *Soil Survey of Kern County, California, Southeastern Part* (Valverde and Hill 1981). Finally, Dudek compared elevation ranges (calculated from the DTM created in 2006 (Intermap Technologies 2005) to known elevation ranges for the potentially occurring special-status plant species, such as Tejon poppy.

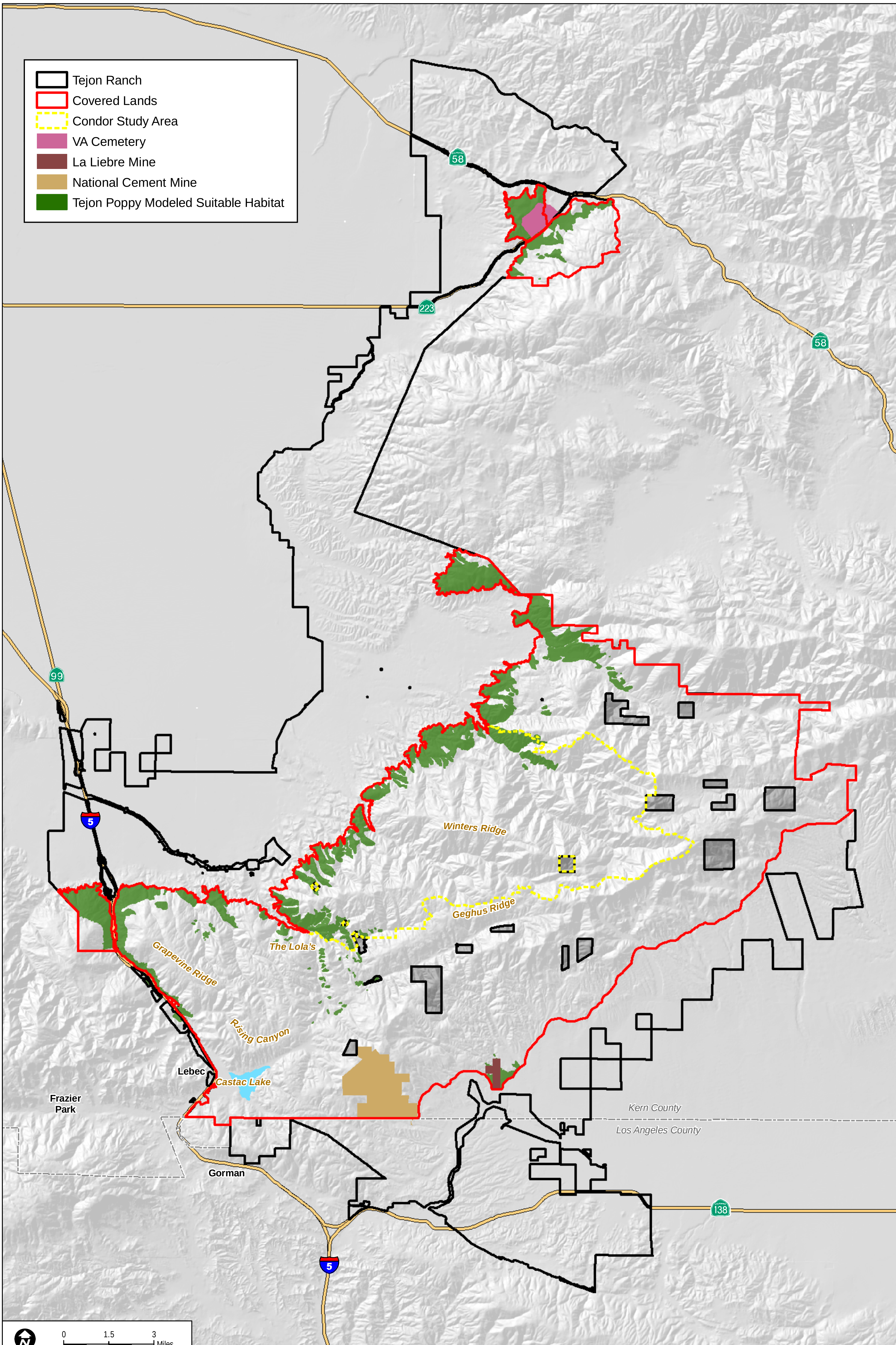
In 2007, the Dudek-supervised botanical survey team conducted two passes of field surveys during the spring/early summer (April 16 through July 9, 2007), plus a third pass in mid-July and late September 2007 for late-blooming species (Dudek 2009). The botanical survey team spent a total of 748 person-days (approximately 7,476 hours), covering roughly 50 to 75 acres per week, conducting focused surveys for special-status plants, including the Tejon poppy.

Tejon poppy was not documented in the TMV Planning Area during the comprehensive, site-wide surveys conducted in 2007 or during other floristic surveys conducted on site from 2003 to 2006 (Dudek 2009). However, the Covered Lands are within the species' range and support potentially suitable habitat. For these reasons, Tejon poppy is considered to have moderate potential to occur within the Covered Lands.

There are no CNDDB records of Tejon poppy in the Covered Lands. There are numerous CNDDB records for Tejon poppy that lie west of the Covered Lands in Kern County (CDFG 2011a). Three records were recorded within Tejon property, but outside the Covered Lands: The nearest occurrence is approximately 1 mile southwest of the northern section of the Covered Lands, and two other occurrences are west of the Covered Lands in the Tejon Hills (CDFG 2011a; TRC 2007).

Suitable habitat for this species was modeled on all Covered Lands (see *Appendix D* for habitat modeling methods). Modeled suitable habitats on Covered Lands are scrub and grassland at elevations between 1,900 and 3,300 feet.

Modeled suitable habitat within Covered Lands for Tejon poppy is shown in *Figure 5-28*, *Tejon Poppy Modeled Suitable Habitat*. A total of 12,672 acres of suitable habitat for Tejon poppy was modeled for Covered Lands.



SOURCE: TRC 2007

FIGURE 5-28

Tejon Poppy Modeled Suitable Habitat

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6. POTENTIAL BIOLOGICAL IMPACTS/TAKE ASSESSMENT

This section, together with *Section 5, Other Covered Species,* and Section *7, Conservation Plan for Other Covered Species,* of the Tehachapi Uplands Multiple Species Habitat Conservation Plan (TU MSHCP), provides a complete analysis of the 26 Other Covered Species. This introduction summarizes the content of each section along with the linkages between them.

Section 5 focuses on the natural history of each of the 26 species, including status, distribution, and habitat characteristics, along with literature sources. Specific information is provided regarding the occurrence of the species within Covered Lands, along with the regulatory setting and listing status for each species. *Section 5* also summarizes the data and data sources used for the analysis of the 26 Other Covered Species, including data on vegetation communities, species occurrences, water features and drainages, topography, soils, and imagery. For this TU MSHCP, a model was developed for each of the 26 Other Covered Species to identify and map suitable habitat for the species within Covered Lands using relevant available data. *Section 5* summarizes the habitat suitability analysis process and references *Appendix D* of the TU MSHCP, where a detailed documentation of the model inputs for each species is provided. Maps depicting the model outputs for each species are presented in this section.

This section provides the impact analysis and take assessment for each of the 20 wildlife Other Covered Species and coverage analysis of the six plant Other Covered Species based on the project description and description of Covered Activities included in *Section 2, Plan Description and Activities Covered by Permit*. The impact assessments for the 26 Other Covered Species in this section are both quantitative and qualitative, and a description of the methods used for the impact assessment is included. For the 20 wildlife Other Covered Species, the take assessments first quantify the effects of Covered Activities with respect to reduction or loss of modeled suitable habitat; then available information regarding the size of territories or home ranges is used, as appropriate for a particular Covered Species, to estimate the number of individuals a modeled habitat acreage may support, assuming the modeled habitat is uniformly and fully saturated (e.g., at carrying capacity). This sets the theoretical upper end of the population size in the modeled habitat. This high-end estimate is then revised downward based on the fact that modeled habitat is highly unlikely to be saturated (e.g., based on site-specific surveys showing scattered and/or low-density populations) and other species-specific factors (e.g., concentrations in microhabitat). The revised estimate is the basis for estimating the number of individuals, breeding territories, etc. that could be lost prior to and after implementation of avoidance and minimization measures. For several species, the best estimate that can be made is the loss of a small, but indeterminable number of individuals (e.g., the salamanders). The impacts of the take analyses include a summary of the status and distribution of the species within its range, a summary of the loss and conservation of the species expected to occur with implementation of the TU MSHCP, and a conclusion regarding the overall impacts of the take associated with the TU MSHCP on the species as a whole. The assessment for all Other Covered Species includes implementation of conservation and avoidance and minimization measures described in greater detail in *Section 7*.

Section 7 presents the conservation plan proposed to be implemented as part of the TU MSHCP, along with the avoidance, minimization, and mitigation measures incorporated in the conservation plan to offset the effects analyzed in *Section 6*. *Section 7* first states conservation goals and objectives for each of the 26 Other Covered Species, including goals for conservation of modeled suitable habitat and management of threats to the species. Avoidance, minimization, and mitigation measures are described. The primary feature of the TU MSHCP to avoid, minimize, and mitigate impacts to Covered Species is the conservation of about 91% of Covered Lands within permanently protected and managed open space. This feature of the plan is described in *Sections 2* and *7* of the TU MSHCP. Monitoring, management, adaptive management, and reporting measures incorporated in the TU MSHCP are described in this section as part of the overall conservation plan. *Section 7* also describes the ways in which take will be measured during implementation of the TU MSHCP in terms of habitat loss, the rationale for use of habitat loss as a measurement for take, and specific quantification of the take authorized by the TU MSHCP.

6.1 EFFECTS OF COVERED ACTIVITIES ANALYSIS METHODS AND ASSUMPTIONS

Methods used to analyze effects on the Covered Species due to Covered Activities are both quantitative and qualitative.

Quantitative methods with respect to modeled suitable habitat for Covered Species include the following:

- Define and map modeled suitable habitat for each of the Covered Species.
- Intersect modeled suitable habitat with commercial and residential Covered Activities with permanent impacts to quantify acreage of affected modeled suitable habitat within these areas.[1]

[1] The percentages of modeled habitat conserved and lost may not sum to 100% for three possible reasons: (1) rounding error; (2) 75% of riparian/wetlands are assumed avoided in development areas, but avoided areas are not included in the open space acreages; and (3) 145 acres in the Lebec/Existing Headquarters Area are not developed but are not included in the open space acreages.

Quantitative methods with respect to Covered Species occurrences include the following:

- Document known occurrences of the particular Covered Species within the Covered Lands.
- Intersect the known occurrences with commercial and residential Covered Activities with permanent impacts.
- Estimate potential additional occurrences, as appropriate, within modeled suitable habitat based on results of previous surveys (e.g., within the Tejon Mountain Village (TMV) Planning Area) and on available life history information in the species accounts for the particular species (e.g., territory size, home range, and typical population densities and spatial distribution patterns).
- Estimate potential impacts to individuals of each species, to the extent feasible, and modeled suitable habitat.
- Estimate the reduction of impacts to Covered Species individuals as a result of applying avoidance and minimization measures, as appropriate.

Qualitative methods with respect to modeled suitable habitat and species occurrences include the following:

- Assess potential effects due to non-permanent Covered Activities based on descriptions of Covered Activities in *Section 2* and known and likely threats to each species as identified in the species accounts in *Sections 4* and *5*.

Following the analysis of the effects on the Covered Species due to Covered Activities, the impacts of any potential incidental take (identified in the analysis of effects of Covered Activities) are analyzed for wildlife Covered Species. This analysis considers the impacts of the Covered Activities on the species overall and across its range, thus species' ranges and subregional ranges are considered for purposes of this analysis.

While take of plants is not prohibited under the Federal Endangered Species Act (FESA) (16 U.S.C. 1531 et seq.), the impacts of the Covered Activities on the plants, as species and across their ranges, are identified and mitigated.

6.2 POTENTIAL TAKE AND IMPACTS TO OTHER COVERED SPECIES

6.2.1 AMPHIBIANS

In addition to impacts from permanent habitat loss, other potential non-permanent effects include impacts discussed below.

Short-term construction-related impacts with potential non-permanent effects on amphibians include impacts to water quality and dust. Amphibians have permeable, exposed skin and eggs that may readily absorb substances, including toxins, from the environment. Their eggs are laid in water or in moist areas, and their larvae are aquatic for some species. Most amphibians have a two-stage life history that includes at least a portion within wetland habitats or they rely on a moist environment for a portion of their life cycle. Their eggs lack a protective membrane and must be laid in moist settings, thus they are very sensitive to changes in water quality. Because amphibians are intimately tied to an aquatic or more mesic environment, the quality of the water in which they live can affect their growth, development, and survival. Pollutants, runoff of pesticides, waterborne pathogens, and sediment can all affect water quality, and these factors can in turn affect amphibians. Even when living the portion of their life cycle on land, the amphibian's skin is more or less freely permeable to water and to air and has no natural barrier to water loss. Thus, although they do have lungs, a portion of the oxygen that they require is acquired through diffusion through their skin. Dust settling directly on them or within areas where they may become covered with it has the potential to interfere with the oxygen diffusion process. Dust can also transport other compounds that may affect amphibians, and other substances can be tightly bound to dust particles. If settled dust, as sediment, is transported into aquatic ecosystems, these substances can be released and may be toxic to amphibians. Dust can also be bound to pesticides, and, if the dust settles directly on the animal, the chemical can be absorbed directly through their skin.

Long-term (operational) impacts with potential non-permanent effects on amphibians include exotic plant and animal species such as Argentine ant (*Linepithema humile*), urban runoff, lighting effects on habitat occupied by the species, and cattle-related impacts. Once established, some invasive species have the ability to displace or replace native plant and animal species, disrupt nutrient and fire cycles, and cause changes in the pattern of plant succession. Native amphibian and reptile populations may be threatened from exotic invasive species of plants and animals, including other reptiles and amphibians. As habitats are changed and plant community organization is modified by exotic species, the relationships between plants and animals may be altered or eliminated. Argentine ants are more aggressive than native ants and have been found to displace the natives and are now widespread throughout California. These ants may also play a role in disrupting and depressing the arthropod community within natural areas, and, therefore, might affect a number of amphibian species (Haas et al. 2002). The potential impacts of urban runoff, as discussed previously, may result in transport of sediment and toxins to which amphibians are sensitive due to their permeable skin and eggs. Artificial light can affect physiology and behavior of animals, leading to ecological consequences at the population, community, and ecosystem levels. Aquatic ecosystems may be particularly vulnerable to such effects and nocturnally breeding animals, such as frogs and other amphibians, may be especially affected (Baker and Richardson 2006). Cattle-related impacts include grazing and congregating in areas that are used by amphibians, including wetland or aquatic breeding areas and adjacent uplands where amphibians may forage, aestivate, and hibernate. Cattle may trample soils, riparian and wetland vegetation, burrows, or individuals and disturb breeding pools that support egg masses and tadpoles at critical phases of their life cycle. Cattle congregating in wetland and aquatic habitat can also impair water quality (e.g., turbidity, urine, and feces). These impacts may both degrade habitat quality and directly affect amphibian reproductive success and recruitment into the local population.

6.2.1.1 TEHACHAPI SLENDER SALAMANDER

6.2.1.1.1 DISCUSSION OF POTENTIALTAKE OF TEHACHAPI SLENDER SALAMANDER

Covered Activities would result in the permanent loss of 143 acres (4%) of modeled suitable habitat for Tehachapi slender salamander (*Batrachoseps stebbinsi*) within Covered Lands based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-3, Tehachapi Slender Salamander Modeled Suitable Habitat*, and *Appendix D* for a description of methods used to develop the model). As stated in Section 5.2.1.1.1, the Tehachapi slender salamander home range is suspected to be approximately 0.5 acre (USFS 2006a), and the area of Tehachapi slender salamander surface activity probably covers its area of underground activity (Morey 2005). Assuming a home range of 0.5 acre, a uniform, non-overlapping distribution of individuals, and saturation of the entire 143 acres of modeled suitable habitat anticipated to be permanently lost, habitat reduction associated with this TU MSHCP could result in the loss of habitat supporting up to 286 individuals.

This estimate, however, is considered to be high because the Tehachapi slender salamander is not expected to occupy all modeled suitable habitat on Covered Lands. In fact, within modeled suitable habitat, Tehachapi slender salamander likely only occurs within talus or otherwise rocky areas, areas with fallen logs and leaf litter, and potentially dead yuccas (*Yucca* spp.). Specific data for these microhabitat features are not available for Covered Lands and, therefore, were not included in the model to determine the estimate of modeled suitable habitat for the salamander. Focused surveys for the species in modeled suitable habitat in the TMV Planning Area documented the Tehachapi slender salamander in 1 of approximately 77 drainages surveyed, a presence rate of 1.3% in drainages with modeled suitable habitat. However, because the activity patterns of the Tehachapi slender salamander are largely dependent upon temperature range and precipitation patterns, which are erratic in both timing and amount within the species' range (Hansen and Wake 2005; AmphibiaWeb 2008), an occupation rate for modeled suitable habitat based upon these survey data cannot be used to determine loss estimates of Tehachapi slender salamander individuals. In addition, the literature suggests that the Tehachapi slender salamander does not occur in uniform distributions. Tehachapi slender salamander seems to be limited to localized or clustered populations, with overlapping distributions of individuals, due to the species' specific microhabitat requirements (talus, canyon live oak, north-facing slopes), limited dispersal (Hansen and Wake, pers. comm. 2008), and lack of territorial behavior (USFS 2006a). Because the species likely occurs in clustered or patchy distributions, it is reasonable to assume that the number of individuals likely to be permanently lost is substantially smaller than the estimated 286 individuals that could be lost with the permanent loss of 143 acres of saturated modeled suitable habitat within Covered Lands. However, because of its patchy distribution within its range and because the species' activity patterns are associated with temperature and precipitation, establishing precise population densities and loss estimates of Tehachapi slender salamander individuals cannot be made without extensive population sampling. The expected loss of Tehachapi slender salamander would be a small but indeterminable number. This estimate would be further reduced with application of avoidance and minimization measures identified for this species in Section 7.1.1.1.1 of this TU MSHCP, including pre-construction surveys, capture and relocation of individuals, exclusion fencing, and construction monitoring. A more precise estimate of the number of individuals permanently lost cannot be made because the success of the avoidance and minimization measures would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

In addition to the short-term construction-related impacts with potential non-permanent effects on amphibians noted in Section 6.2.1, short-term construction-related impacts with potential non-permanent effects on Tehachapi slender salamander include inadvertent impacts to modeled suitable habitat outside of designated project disturbance zones, impacts to individuals outside of designated project disturbance zones, and impacts to individuals wandering into disturbance zones following commencement of construction activities.

Other Covered Activities with potential non-permanent effects on Tehachapi slender salamander individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled suitable habitat); ranch operations related to maintenance of culverts and drainages; utility maintenance; film production; and human presence and associated passive and active recreation that could result in habitat degradation, collection, and possible mortality.

Conservation measures to address these threats are provided in Section 7.1.1.1.1.

6.2.1.1.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO TEHACHAPI SLENDER SALAMANDER

The Tehachapi slender salamander is endemic to California, with its known historical range occurring in Kern County. Major known populations are associated with Caliente Creek, Tejon

Canyon, Beartrap Canyon, Pastoria Creek, Monroe Canyon, and Fort Tejon and surrounding tributaries. Because of the relatively small and concentrated range of this species, the impacts of incidental take of Tehachapi slender salamander are analyzed from both a habitat and species perspective within the context of its entire range.

The Tehachapi slender salamander was listed by the State of California as threatened in 1971 but currently is not Federally listed as threatened or endangered (CDFG 2008a). The U.S. Fish and Wildlife Service (USFWS) recently completed its 12-Month Finding to determine whether it should be Federally listed as threatened and concluded, based on the available scientific and commercial literature, that a listing as threatened was not warranted (76 FR 62900).

The Covered Lands are situated within the species' known current range in Southern California. Biologists who surveyed the TMV Planning Area in 2007 detected the species in Monroe Canyon, but the species is also known to occur in Beartrap and Tejon canyons and adjacent to the California aqueduct. The species is expected to occur in Covered Lands in suitable habitat in discrete patches, as observed during the 2007 surveys in the TMV Planning Area.

Covered Activities would result in the permanent loss of 143 acres (4%) of modeled suitable habitat for Tehachapi slender salamander within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled suitable habitat and a uniform distribution, this would amount to a potential loss of habitat supporting up to 286 individuals. However, based on scattered distribution of individuals observed within the TMV Planning Area (i.e., Monroe and Beartrap Canyon) and because not all modeled habitat is expected to be occupied by this species (due to the species association with talus areas), it is reasonable to assume that the number of individuals that could be lost with the permanent loss of 143 acres within Covered Lands is substantially smaller than 286 individuals. The expected loss of Tehachapi slender salamander is a small but indeterminable number. This loss could be further reduced with application of avoidance and minimization measures (pre-construction surveys, capture and relocation, exclusion fencing, and monitoring), but the success of these measures would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 3,921 acres (96%) of modeled suitable habitat for this species within Covered Lands.

The permanent loss of 4%[2] of modeled suitable habitat within Covered Lands and a small but indeterminable number of individuals resulting from permanent habitat loss associated with Covered Activities prior to implementation of avoidance and minimization measures would not substantially affect the species' population and distribution on site nor would it substantially affect the species over its larger range in Kern County.

6.2.1.2 WESTERN SPADEFOOT

6.2.1.2.1 DISCUSSION OF POTENTIAL TAKE OF WESTERN SPADEFOOT

Covered Activities would result in the permanent loss of 30 acres (3%) of modeled suitable habitat for western spadefoot (*Spea [Scaphiopus] hammondii*) within Covered Lands based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-4* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.1.2.1, the home range of the western spadefoot was estimated in one study at approximately 1 acre (Basey and Sinclear 1980), although opportunistic field observations indicate that they readily move up to at least several hundred meters from breeding sites (NatureServe 2010). Assuming a home range size of 1 acre, a non-overlapping and uniform distribution of individuals, and saturation of the entire 30 acres of modeled suitable habitat, this would amount to a potential loss of up to 30 individuals, not including egg masses and tadpoles (which may occur in the thousands at a single breeding site).

This estimate, however, is considered to be high for several reasons. First, as stated in Section 5.2.1.2.3, presence/absence surveys for western spadefoot in all modeled suitable habitat in the TMV Planning Area portion of the Covered Lands were negative. Second, based on the negative surveys in the TMV Planning Area and the fact that Covered Lands are east of the western spadefoot's known geographic range, the potential for occurrence on Covered Lands is considered to be low below 3,000 feet above mean sea level (amsl) and to be very low above 3,000 feet amsl. Therefore, the overall rate of occupation within modeled suitable habitat on Covered Lands is considered to be low to very low; that is, if the western spadefoot is present on Covered Lands, it is expected to occur in a very sporadic and patchy distribution within modeled suitable habitat. Therefore, the number of individuals expected to be permanently lost with the permanent loss of 30 acres of modeled suitable habitat within Covered Lands would be considerably less than 30 individuals prior to application of avoidance and minimization measures. If the species were present on Covered Lands, with the permanent loss of 30 acres of modeled suitable habitat, it is estimated that a loss of up to 10 adult, sub-adult, or metamorph individuals could occur. It is also estimated that prior to the implementation of the avoidance and

[2] Conservation and impact percentages are rounded to the nearest whole number and may not always sum to 100%. In addition, some small amounts of modeled suitable habitat for a species may not occur in development or conservation areas, in these cases the conservation and impact percentages also would not sum to 100%.

minimization measures, the proposed commercial and residential Covered Activities could result in impacts to one breeding site that could support egg masses and up to thousands of tadpoles. The number of individuals permanently lost could be further reduced with application of the avoidance and minimization measures identified for this species in Section 7.1.1.1.2 of this TU MSHCP, including pre-construction surveys, avoidance of breeding sites (egg masses and tadpoles), capture and relocation of individuals, exclusion fencing, and construction monitoring. The degree to which avoidance and minimization measures would further reduce impacts, however, depends on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Short-term (construction-related) and long-term (operational) impacts with potential non-permanent effects on amphibians, including western spadefoot, are noted in Section 6.2.1. Other Covered Activities with potential non-permanent effects on western spadefoot individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled suitable habitat); ranch operations related to maintenance of culverts and drainages; utility maintenance; film production; and human presence and associated passive and active recreation that could result in habitat degradation, collection, and possible mortality.

Conservation measures to address these threats are provided in Section 7.1.1.1.2.

6.2.1.2.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO WESTERN SPADEFOOT

The western spadefoot is endemic to California and northern Baja California, Mexico. The species ranges from the north end of California's great Central Valley near Redding to the south, east of the Sierras and the deserts, into northwest Baja California (Jennings and Hayes 1994; Stebbins 2003). The Covered Lands are situated just east of the species' known current range in Southern California, and the species was not observed in the TMV Planning Area during surveys in 2007. The impacts of incidental take of western spadefoot are analyzed, from both a habitat and species perspective, within the context of its entire range in California.

The western spadefoot was not detected during surveys in the TMV Planning Area and it is considered to have low potential to occur on Covered Lands below 3,000 feet amsl and very low potential to occur on Covered Lands above 3,000 feet amsl.

Covered Activities would result in the permanent loss of 30 acres (3%) of modeled suitable habitat for western spadefoot within Covered Lands. The negative surveys in 2007 indicate that the western spadefoot has a low to very low potential to occur on Covered Lands, thus the estimate of take of individuals is based on the assumption that if the western spadefoot is present, it occurs in relatively limited locations and in small numbers. Based on factors such as the documented home range size of the species, and likely very patchy distribution of individuals in suitable habitat, if present on site, and application of all avoidance and minimization measures (pre-construction surveys, relocation, construction monitoring), permanent impacts to 30 acres of modeled suitable habitat would result in an estimated loss of up to 10 adults, sub-adults, or metamorphs. It is also estimated that prior to the implementation of the avoidance and minimization measures, the proposed commercial and residential Covered Activities could result in impacts to one breeding site that could support egg masses and up to thousands of tadpoles.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 1,055 acres (90%) of modeled suitable habitat for this species within Covered Lands. Furthermore, the modeled suitable habitat for the western spadefoot will be preserved within a large, unfragmented open space system, the Covered Lands are east of the species' known current range in Southern California, and this species has a broad range in California, extending from the Central Valley near Redding to the south into northwest Baja California, Mexico, and east of the Sierras in the desert. Therefore, the permanent loss of 3% of modeled suitable habitat within Covered Lands and 10 adults, sub-adults, or metamorphs resulting from permanent habitat loss associated with Covered Activities would not substantially affect the species' population and distribution on site, nor would it substantially affect the species over its much larger range in California.

6.2.1.3 YELLOW-BLOTCHED SALAMANDER

6.2.1.3.1 DISCUSSION OF POTENTIAL TAKE OF YELLOW-BLOTCHED SALAMANDER

Covered Activities would result in the permanent loss of 1,179 acres (3%) of modeled suitable habitat for yellow-blotched salamander (*Ensatina eschscholtzii croceater)* within Covered Lands based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-5* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.1.3.1, the home range of the ensatina (of which the yellow-blotched salamander is a subspecies) has been estimated to be up to 1 acre (USFS 2006b). Assuming a home range of 1 acre; a uniform, non-overlapping distribution of individuals; and saturation of the entire 1,179 acres of modeled suitable habitat anticipated to be permanently lost, habitat reduction associated with this TU MSHCP could result in the loss of habitat supporting up to 1,179 individuals.

This estimate, however, is considered to be high because the yellow-blotched salamander is not expected to occupy all modeled suitable habitat on Covered Lands and is not uniformly distributed throughout suitable habitat; however, this species can be locally common where present (Hansen and Wake, pers. comm. 2008). During the survey of the TMV Planning Area, biologists documented 17 yellow-blotched salamander individuals primarily within modeled suitable habitat. However, because the surface activity patterns of the yellow-blotched salamander are highly correlated with surface moisture (Stebbins 1951, 1954), which varies depending on several environmental conditions (such as temperature, precipitation, etc.), an occupation rate for modeled suitable habitat based upon these presence/absence survey data cannot be used to determine loss estimates of yellow-blotched salamander individuals. In addition, according to Hansen and Wake (pers. comm. 2008), this species does not occur in uniform distributions. Yellow-blotched salamander seems to be limited to localized or clustered populations, due to species-specific microhabitat requirements (typically found under rocks, logs, or other debris, more prevalent in north-facing areas that are shaded, especially near creeks and streams). Because the species likely occurs in clustered or patchy distributions, it is reasonable to assume that the number of individuals likely to be permanently lost is substantially smaller than the estimated 1,179 individuals that could be lost with the permanent loss of 1,179 acres of saturated modeled suitable habitat within Covered Lands. However, because of its patchy distribution within its range and because the species' activity patterns are associated with surface moisture, precise population density and loss estimates of yellow-blotched salamander individuals cannot be made without extensive population sampling. The expected loss of yellow-blotched salamander would be a small but indeterminable number. This estimate would be further reduced with application of avoidance and minimization measures identified for this species in Section 7.1.1.1.3 of the TU MSHCP, including pre-construction surveys, capture and relocation of individuals, exclusion fencing, and construction monitoring. A more precise estimate of the number of individuals permanently lost cannot be made because the success of the avoidance and minimization measures would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Short-term (construction-related) and long-term (operational) impacts with potential non-permanent effects on amphibians, including yellow-blotched salamanders, are noted in Section 6.2.1.

Other Covered Activities with potential non-permanent effects on yellow-blotched salamander individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled suitable habitat); ranch operations related to maintenance of culverts and drainages; utility maintenance; film production; and human presence and associated passive and active recreation that could result in habitat degradation, collection, and possible mortality.

Conservation measures to address these threats are provided in Section 7.1.1.1.3.

6.2.1.3.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO YELLOW-BLOTCHED SALAMANDER

The yellow-blotched salamander is endemic to California with its known historical range limited to Ventura and Kern counties. Major known populations are associated with Tehachapi Mountains, Mount Pinos, near Fort Tejon, and near Frazier-Alamo Mountain. Because of the relatively small and concentrated range of this subspecies, the impacts of the incidental take of yellow-blotched salamanders are analyzed, from both a habitat and species perspective, within the context of its entire range.

The yellow-blotched salamander is not listed as threatened by the State of California or USFWS and no critical habitat has been designated.

The Covered Lands generally are situated in the central portion this species' known current range in Southern California. Biologists observed this species during 2007 surveys in the TMV Planning Area (Dudek 2009) and most occurrences were in the southwestern portion of Covered Lands, generally east of Grapevine Peak, in the vicinity of Silver, Monroe, Squirrel, Palos Altos, and Johnson canyons, and along Beartrap Canyon and its tributaries. It is expected to occur throughout Covered Lands in suitable habitat in a similar distribution as observed in the TMV Planning Area.

Covered Activities would result in the permanent loss of 1,179 acres (3%) of modeled suitable habitat for yellow-blotched salamander within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled suitable habitat and a uniform distribution, this would amount to a potential loss of habitat supporting up to 1,179 individuals. However, based on scattered distribution of individuals observed within the TMV Planning Area and because not all modeled habitat is expected to be occupied by this species (due to the species association with microhabitat requirements), it is reasonable to assume that the number of individuals that could be lost with the permanent loss of 1,179 acres within Covered Lands is substantially smaller than 1,179 individuals. The expected loss of yellow-blotched salamander is a small but indeterminable number. This loss could be further reduced with application of avoidance and minimization measures (pre-construction surveys, capture and relocation, exclusion fencing, and monitoring), but the success of these measures would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 33,988 acres (97%) of modeled suitable habitat for this species within Covered Lands.

The permanent loss of 3% of modeled suitable habitat within Covered Lands and a small but indeterminable number of individuals resulting from permanent habitat loss associated with Covered Activities prior to implementation of avoidance and minimization measures would not substantially affect the species' population and distribution on site nor would it substantially affect the species over its broader range in Ventura and Kern counties.

6.2.2 BIRDS

In addition to impacts from permanent habitat loss, other potential non-permanent effects to birds include impacts discussed below.

Short-term construction-related impacts with potential non-permanent effects on birds include dust. Dust has the potential to coat the leaves of the vegetation within which birds nest and forage. It is possible that wind-blown dust might degrade the quality of some habitats occupied by birds and may either change the habitat type or result in choking of the vegetation and thus increase the amount of unvegetated areas (Walker and Everett 1987). Vegetation changes due to dust may extend as far as 10 to 20 meters (33 to 66 feet) from the road (Forman 1995). Dust may also be transported into aquatic ecosystems where it contributes to sedimentation and may negatively affect vegetation communities. The dust coating may also cover the insect prey of insectivorous species, making it more difficult for foliage-gleaning bird species to successfully forage.

Long-term (operational) impacts with potential non-permanent effects on birds include exotic plant and animal species and urban runoff on habitat occupied by the species. Invasion of non-native plants has been found to modify the structure and composition of riparian vegetation as well as other vegetation communities. This has been found to have negative effects on birds by reducing the structural and compositional diversity of the vegetation (Fleishman et al. 2003). As noted previously, some invasive plant species have the ability to displace or replace native plant and animal species, disrupt nutrient and fire cycles, and cause changes in the pattern of plant succession. Native bird populations may be threatened from exotic invasive species of animals, including other birds, such as European starling (*Sturnus vulgaris*), which often evict native bird species from their nest cavities (Zeiner et al. 1990b). As noted previously, as community organization is modified by exotic species, the native community relationships may be altered or eliminated. The potential impacts of urban runoff may include an increase in flooding or inundation, which could result in conversion of more upland forest habitats to marshland habitats, thus resulting in loss of habitat for forest-dwelling bird species (Franco et al. 2008). Birds that occur in aquatic ecosystems or utilize resources in aquatic ecosystems may be exposed to toxic substances in runoff similar to amphibians as described in Section 6.2.1.

6.2.2.1 AMERICAN PEREGRINE FALCON

6.2.2.1.1 DISCUSSION OF POTENTIAL TAKE OF AMERICAN PEREGRINE FALCON

Covered Activities would result in the permanent loss of 2,742 acres (10%) of modeled suitable habitat for American peregrine falcon (*Falco peregrinus anatum)* within Covered Lands, including 2,741 acres (10%) of foraging habitat and 1 acre (less than 1%) of breeding habitat, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-6* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.1.1, the American peregrine falcon is an uncommon breeder or winter migrant throughout much of California (Zeiner et al. 1990b), as well as in much of the western and southwestern regions of the United States; it is also an uncommon breeder and winter migrant in northern Mexico. Through 2007 in California, approximately 274 nesting sites were documented as “active” (i.e., used at least once since 1975) in 40 counties spanning the length of the state (Comrack and Logsdon 2007, Table 1).

This species was observed foraging on a single occasion in the TMV Planning Area in 2007 and was not observed to be breeding. The loss of 1 acre of breeding habitat, therefore, would not directly affect, and is not likely to indirectly affect a breeding site because this species is expected to use the Covered Lands only as a stopover during migration periods or possibly as an occasional winter visitor; no breeding is expected to occur within Covered Lands.

In addition to the short-term construction-related impact with potential non-permanent effects on birds noted in Section 6.2.2, a short-term construction-related impact with potential non-permanent effects on American peregrine falcon includes impacts to water quality.

Long-term (operational) impacts with potential non-permanent effects on birds, including the American peregrine falcon, are mentioned in Section 6.2.2.

Other Covered Activities with potential non-permanent effects on American peregrine falcon individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading riparian/wetland foraging and wintering habitat), ranch operations related to maintenance of roads, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Because the American peregrine falcon is a California Fully Protected species, avoidance and mitigation measures identified in Section 7.1.1.2.1 of this TU MSHCP are designed to avoid lethal take. Measures related to commercial and residential Covered Activities include pre-grading construction surveys, establishment of a 0.25-mile protection zone around active nests, if found, and monitoring of construction activities. Measures for long-term operational Covered Activities include pre-activity surveys in breeding habitat and establishment of a 1,000-foot protection zone around active nest sites, if found; public education and regulation of recreation through the Public Access Plan; baseline surveys to inform management; pre-disturbance surveys prior to installation of infrastructure and trails, and contractor education, staking and temporary construction fencing, if found; and siting of new public access trails in consultation with the project biologist.

6.2.2.1.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO AMERICAN PEREGRINE FALCON

As stated in Section 6.2.2.1.1, the American peregrine falcon is an uncommon breeder or winter migrant throughout much of California, as well as in western Oregon, the southwest, and Central Plains region of the United States. It is absent from desert areas (Zeiner et al. 1990b). In California, active nests have been documented along the coast north of Santa Barbara, in the Sierra Nevada, and in other mountains of northern California. Wintering migrants can be seen inland throughout the Central Valley, in the western Sierra Nevada, along the coast, and occasionally on the Channel Islands (Zeiner et al. 1990b). Spring and fall migrants of the American peregrine falcon occur along the coast and in the western Sierra Nevada Mountains (Brown 1999). As a transient species, this species may occur almost anywhere that suitable habitat is present (Garrett and Dunn 1981). For this reason, the scale for analyzing the impacts of incidental take of the American peregrine falcon considers the broad migration and wintering range of the species throughout the western, southwestern, and Central Plains regions of the United States. Where it nests, nesting densities vary and are generally dependent upon availability of prey (Thelander 1977). Throughout California, breeding densities of American peregrine falcons have ranged from upwards of one pair per 300,000 acres to one pair per 92,000 acres in relatively undisturbed habitats (Thelander 1977).

American peregrine falcons have only been observed during the fall in the portions of the Covered Lands that have been surveyed, and no current or historical nest sites have been reported to occur within Covered Lands. It is expected that the American peregrine falcon uses the Covered Lands only as a stopover during migration periods or possibly as an occasional winter visitor. However, approximately 79 acres of modeled breeding (cliff-type) habitat occur on Covered Lands, and though the American peregrine falcon is not expected to nest on Covered Lands, the possibility of this species nesting on site cannot be dismissed. Even at the higher breeding density cited above, however, and assuming that undisturbed areas adjacent to the Covered Lands would also be used by this species, Covered Lands likely could support at most one breeding pair of American peregrine falcons.

Covered Activities would result in the permanent loss of 2,742 acres (10%) of modeled suitable habitat for American peregrine falcon within Covered Lands, including 2,741 acres (10%) of modeled foraging habitat and 1 acre (less than 1%) of modeled breeding habitat. No lethal take of individuals would occur.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 23,862 acres (89%) of modeled foraging habitat and 79 acres (99%) of modeled breeding habitat for this species within Covered Lands.

With a maximum of one breeding pair potentially occurring within the Covered Lands, this high level of on-site conservation of modeled suitable habitat, and the large extent of undisturbed habitat adjacent to the Covered Lands that could be used by a breeding pair of American peregrine falcon as well as for foraging, the capacity of the Covered Lands to support a breeding pair would not be substantially reduced. Implementation of avoidance and minimization measures, including pre-construction and pre-activity surveys for nesting American peregrine falcons and establishment of a 0.25-mile protection zone if nesting is observed, will ensure that no lethal take of the species occurs as a result of Covered Activities. Further, the loss of suitable breeding and foraging habitat would not adversely affect the estimated 274 nesting sites that were documented as "active" in California as of 2007 (Comrack and Logsdon 2007).

No data are available regarding densities of American peregrine falcons on wintering or migratory stopover sites. However, the 23,862 acres of modeled foraging habitat that would be conserved, including most of the wetland habitat and all of the aquatic habitat associated with Castac Lake, will be available for migrating and wintering American peregrine falcon. Furthermore, the modeled foraging habitat for migrant and wintering American peregrine falcon will be preserved in a large, unfragmented open space system, and this species migrates and winters throughout California (except for the deserts). Therefore, the loss of 2,741 acres (10%) of modeled foraging habitat for migrating and wintering American peregrine falcon within Covered Lands would not substantially affect this species' use of Covered Lands during migration and wintering nor would it substantially affect the species within its broader migration and wintering range throughout the western/southwestern United States and northern Mexico.

6.2.2.2 BALD EAGLE

6.2.2.2.1 DISCUSSION OF POTENTIAL TAKE OF BALD EAGLE

Covered Activities would result in the permanent loss of 839 acres (43%) of modeled suitable habitat for bald eagle (*Haliaeetus leucocephalus*) within Covered Lands, including 834 acres (58%) of modeled wintering habitat and 5 acres (less than 1%) of modeled foraging habitat, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-7* and *Appendix D* for description of methods used to develop the model). No suitable breeding habitat was modeled for the bald eagle because it has a low potential to breed on Covered Lands. As stated in Section 5.2.2.1.1, the bald eagle is fairly common as a local winter migrant at a few favored inland waters in Southern California, with the largest numbers occurring at Big Bear Lake, Cachuma Lake, Lake Mathews, Nacimiento Reservoir, San Antonio Reservoir, and along the Colorado River (Zeiner et al. 1990b). In California, breeding populations of bald eagles are now restricted mostly to Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity counties (Polite and Pratt 1999). Recent breeding attempts on the mainland south of Santa Barbara County (e.g., Silverwood Lake, Lake Skinner, and Lake Perris) have been unsuccessful (Cleary-Rose, pers. comm. 2002). Individuals that breed in California may make only local winter movements in search of food.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on bald eagle include impacts to water quality.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on bald eagle include lighting effects.

Other Covered Activities with potential non-permanent effects on bald eagle individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading suitable riparian woodland, riparian/wetland, and wetland habitat), ranch operations related to maintenance of roads, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Because the bald eagle is a California Fully Protected species and a species covered by the Federal Bald and Golden Eagle Protection Act (BGEPA), avoidance and minimization measures proposed in Section 7.1.1.2.2 of this TU MSHCP are designed to protect diurnal perches and high-quality roost trees for bald eagle so as to preserve productivity for bald eagles wintering in the area, to avoid lethal take, and to prevent disturbance to individuals (there is no breeding on site and therefore no nests).

6.2.2.2.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO BALD EAGLE

The bald eagle breeds throughout Canada and portions of the United States, and winters throughout the United States and portions of Canada and Mexico. According to Buehler (2000), there is a wintering population of over 20,000 individuals in North America. These individuals are dispersed across the United States, Canada, and northern Mexico, but most spend the winter in large expanses of waterfowl-rich landscapes, such as northeastern California, the Great Lakes states, northern Rockies states, and pothole regions. This species has been delisted by the Federal government due to population increases, but it is still listed by the State of California. No critical habitat or recovery Plans are in effect for the bald eagle. It is still covered by the BGEPA.

The Covered Lands are within the known current range of the bald eagle. However, it is not known to breed within Southern California outside of the Channel Islands, though a few nest-building attempts have been observed at isolated lakes in Riverside County and elsewhere. Wintering individuals have been occasionally noted at various bays, lakes, and estuaries in Southern California, but known major wintering sites are situated around the Big Bear Lake, Cachuma Lake, Lake Mathews, Nacimiento Reservoir, San Antonio Reservoir, and Colorado River areas.

Because of its broad North American distribution and wide-ranging migration patterns, the scale for analyzing the impacts of incidental take of the bald eagle considers the entire wintering range of the species.

Covered Activities would result in the permanent loss of 839 acres (43%) of modeled suitable habitat for bald eagle within Covered Lands, including 834 acres (58%) of modeled wintering habitat and 5 acres (less than 1%) of modeled foraging habitat. No lethal take under FESA or BGEPA of bald eagle individuals would occur as a result of habitat loss, and conservation measures are included to protect diurnal perches and high-quality roost trees for bald eagle so as to preserve productivity for bald eagles wintering in the area.

Specifically, implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 604 acres (42%) of modeled wintering habitat (including perching and roosting habitat) and 499 acres (96%) of modeled foraging habitat for this species within Covered Lands. Other protection measures in the conservation plan include avoidance of habitat disturbances during construction activities that could result in direct disturbance or injury to individuals, reducing impacts of cattle grazing on riparian habitat, distributing educational information to minimize human recreation disturbances, and establishing seasonal setbacks from roost and perch areas. These measures, together with the preservation of winter foraging, roosting, and perch habitat within Covered Lands would, pursuant to the BGEPA, further the eagle conservation goals of BGEPA and provide a net conservation benefit to the species consistent with the goal of stabilizing or increasing breeding populations.

The bald eagle was observed during the winter in the TMV Planning Area in association with Castac Lake, but no wintering congregations were observed. This suggests that the Covered Lands, while providing suitable wintering and foraging habitat for the bald eagle, are not extensively used by the species. To offset the loss of the 834 acres of modeled wintering habitat within Covered Lands, avoidance, minimization, and mitigation measures will be implemented to reduce direct and indirect impacts to wintering bald eagles, including preserving and enhancing preferred diurnal perches and high-quality roost trees associated with Castac Lake and restricting human activity within 500 feet of such roost sites between late October and March.

Preservation of 96% of modeled foraging and 42% of modeled wintering habitat, along with the avoidance, minimization, and mitigation measures, will provide adequate habitat to support the small number of wintering bald eagles expected to use the Covered Lands in the future. These habitats will be preserved within a large, unfragmented open space system. In addition, the bald eagle has an extremely broad range, breeding throughout Canada and portions of the United States, and wintering throughout the United States and portions of Canada and Mexico. In the context of the broad winter distribution of this species throughout North America and the estimated wintering population of 20,000 individuals (Buehler 2000), the loss of 834 acres of modeled wintering habitat and 5 acres of modeled foraging habitat within Covered Lands would not substantially affect this species' use of the Covered Lands as wintering habitat nor would it substantially affect the species within its broader wintering range. Further, under BGEPA, habitat loss does not equate to a take because BGEPA is not a habitat management law, and with the measures described below, no lethal take or "disturbance" of bald eagle individuals would occur as a result of Covered Activities.

6.2.2.3 BURROWING OWL

6.2.2.3.1 DISCUSSION OF POTENTIAL TAKE OF BURROWING OWL

Covered Activities would result in the permanent loss of 3,037 acres (9%) of modeled suitable habitat for burrowing owl (*Athene cunicularia)* within Covered Lands, including 2,485 acres

(10%) of modeled breeding/foraging habitat and 552 acres (7%) of modeled secondary breeding/foraging habitat,[3] based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-8* and *Appendix D* for description of methods used to develop the model). It is estimated that permanent habitat loss associated with Covered Activities could impact up to one active burrow if the burrowing owl were to nest or winter on Covered Lands in the future.

The burrowing owl has a high potential to winter within suitable habitat on non-surveyed portions of Covered Lands but a low potential to breed on site. As stated in Section 5.2.2.3.2, during various surveys conducted in portions of the Covered Lands, one migrant burrowing owl was observed near Tunis Ridge in non-native grassland at approximately 4,900 feet amsl (Dudek 2009). No burrowing owl breeding observations have been made during surveys in any portion of the Covered Lands (Dudek 2009). In addition, there are various California Natural Diversity Database (CNDDB) occurrences in the vicinity of the Covered Lands but none in the Covered Lands (CDFG 2007c).

With application of avoidance and minimization measures identified in Section 7.1.1.2.3 of this TU MSHCP, no burrowing owl individuals would be permanently lost in association with the permanent loss of 3,037 acres of modeled suitable habitat within Covered Lands. These avoidance and minimization measures include pre-construction surveys, CDFG-approved burrow closure methods for non-nesting individuals, avoidance of active nest burrows in project disturbance zones, and 300-foot setbacks from nests established in proximity to project disturbance zones prior to initiation of construction activities.

No short-term construction-related impacts with potential non-permanent effects are expected to affect burrowing owls.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on burrowing owl include lighting effects.

Other Covered Activities with potential non-permanent effects on burrowing owl individuals and/or modeled suitable habitat include cattle-related impacts (e.g., overgrazing in, trampling, and otherwise degrading primary and secondary breeding/foraging habitat), ranch operations related to maintenance of roads, utility maintenance, film production, exotic plant and animal species (e.g., pet cats and dogs), lighting effects, and human presence and associated passive and active recreation that could result in habitat degradation.

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[3] Secondary habitat may not be adequate to meet all or most life history requirements of the species; typically secondary habitat itself is not adequate to support a species.

Conservation measures to address these threats are provided in Section 7.1.1.2.3.

6.2.2.3.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO BURROWING OWL

The western burrowing owl occurs from southern interior British Columbia, southern Alberta, southern Saskatchewan, and southern Manitoba, south through eastern Washington, central Oregon, and California to Baja California, east to western Minnesota, northwestern Iowa, eastern Nebraska, central Kansas, Oklahoma, eastern Texas, and Louisiana, the southern portion of Florida, and south to central Mexico. In many parts of the United States, the western burrowing owl's breeding range has been reduced, and it has been extirpated from certain areas, including western Minnesota, eastern North Dakota, Nebraska, and Oklahoma (Bates 2006), but the species is still widely distributed in western North America (Gervais et al. 2008). The winter range is much the same as the species' breeding range, but the majority of western burrowing owls that breed in Canada and the northern United States are believed to migrate south during September and October and north from March into the first week of May. Therefore, individuals observed in southern portions of the range during the winter may include both resident and migratory individuals (Haug et al. 1993). The subspecies occurring in Florida and Southern California are predominantly non-migratory (Thomsen 1971). The western burrowing owls in northern California are believed to migrate (Coulombe 1971).

Within Covered Lands, the burrowing owl was observed once during protocol surveys in the winter in 2007 in a lower elevation area in the northern portion of the site (Dudek 2009). Because of the relatively high elevation of the Covered Lands, the potential for the burrowing owl to breed on site is low, but cannot be completely dismissed.

Covered Activities would result in the permanent loss of 3,037 acres (9%) of modeled suitable habitat for burrowing owl within Covered Lands, including 2,485 acres (10%) of modeled breeding/foraging habitat and 552 acres (7%) of modeled secondary breeding/foraging habitat.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 22,406 acres (90%) of modeled breeding/foraging habitat and 7,521 acres (93%) of modeled secondary breeding/foraging habitat for this species within Covered Lands.

With this substantial level of preservation within a large, unfragmented open space system, adequate modeled breeding/foraging habitat would be conserved in Covered Lands to support the small wintering population of the burrowing owl anticipated to use the site in the future. Additional avoidance and minimization measures will be implemented to ensure that active breeding burrows are not disturbed by Covered Activities, including pre-construction and pre-activity surveys and avoidance of active nest burrows. Active wintering burrows will be evacuated using California Department of Fish and Game (CDFG)-approved burrow closure procedures. Furthermore, this species is broadly distributed throughout western North America, from Canada south to Central America. Within California, the burrowing owl occurs throughout the state except for the high mountains and humid, forested areas of northwestern California. The main breeding population centers for the species are in the Imperial and Central valleys, where very large breeding populations remain in agricultural areas on private lands (Gervais et al. 2008).

With this level of conservation and avoidance/minimization measures, the loss of 2,485 acres (10%) of modeled breeding/foraging habitat and 552 acres (7%) of modeled secondary breeding/foraging habitat within Covered Lands, and up to one active burrow if the burrowing owl were to nest or winter in the project area in the future, would not substantially reduce the burrowing owl's use of Covered Lands and would not substantially affect the species within its broad migration/wintering and breeding range within California and its much larger range within western North and Central America.

6.2.2.4 GOLDEN EAGLE

6.2.2.4.1 DISCUSSION OF POTENTIAL TAKE OF GOLDEN EAGLE

Covered Activities would result in the permanent loss of 7,698 acres (7%) of modeled suitable habitat for golden eagle (*Aquila chrysaetos)* within Covered Lands, including 2,045 acres (6%) of modeled breeding/foraging habitat, 3,040 acres (9%) of modeled foraging habitat, and 2,613 acres (5%) of modeled primary breeding habitat, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-9* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.4.1, golden eagle home range size, which is probably the same as the territory (Zeiner et al. 1990b), has been estimated to average 5,709 acres in Utah (Smith and Murphy 1973) and 8,092 acres in southwestern Idaho (Collopy and Edwards 1989). Radiotelemetry studies of golden eagles in the Snake River Birds of Prey National Conservation Area in Idaho, however, demonstrated that home ranges can be seasonally quite variable, ranging from 0.7 square mile (469 acres) to 32 square miles (20,575 acres) during the breeding season and from 5 square miles (3,384 acres) to 656 square miles (419,900 acres) during the non-breeding season (Marzluff et al. 1997). Because of the relatively large prey base on Tejon Ranch and the relative close proximity of the three known active nests within the TMV Planning Area, it is assumed that the home range sizes of nesting pairs on the ranch are at the lower end of the home range estimates provided in the literature and may possibly be similar to the average sizes noted by Smith and Murphy (1973) and Collopy and Edwards (1989); i.e., from 5,000 to 8,000 acres in size, and possibly smaller.

Three active nests were observed in the TMV Planning Area in 2007, which supports 23,344 acres of modeled suitable habitat for the golden eagle. Assuming exclusive territories, this represents about 7,781 acres of available suitable habitat per nest site. Based on documented home range sizes of this species and the density of nesting pairs observed in the TMV Planning Area, and assuming saturation of all modeled suitable habitat, the permanent loss of 7,698 acres of modeled suitable habitat within Covered Lands represent the potential loss of habitat possibly supporting one nesting pair. However, as discussed below, no actual lethal take under the FESA or BGEPA of golden eagle individuals would occur as a result of habitat loss, and conservation measures are included to conserve substantial breeding and foraging habitat so as to preserve productivity for golden eagles in the area.

Human activity would increase as a result of development-related Covered Activities in proximity to golden eagle nest sites and foraging areas, resulting in long-term indirect effects to golden eagle. Breeding golden eagles appear to be quite sensitive to human presence; see Section 7.1.1.2.4 for detailed avoidance and minimization measures in the goals and objectives for golden eagle.

In addition to the short-term construction-related impacts and long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on golden eagle include lighting effects.

Other Covered Activities with the potential to cause non-permanent effects on golden eagle individuals and/or modeled suitable habitat include cattle-related impacts (e.g., overgrazing, congregating in, trampling, and otherwise degrading primary breeding, breeding/foraging, and foraging habitat), ranch operations related to maintenance of roads, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Because the golden eagle is a California Fully Protected species and a species covered by the Federal BGEPA, avoidance and minimization measures proposed in Section 7.1.1.2.4 of this TU MSHCP are designed to conserve substantial areas of suitable nest and foraging habitat so as to preserve productivity and territory integrity for golden eagles in the area, to avoid lethal take, and to prevent disturbance to individuals or their nests. To date, three active primary nest sites have been identified. Prior to grading for the backbone infrastructure, surveys (which will inform the site constraints planning effort for potential development sites) would be conducted during the breeding season within 1.0 mile of construction areas to determine the status of those previously identified nests and to identify any associated recently established alternate nests by existing eagle pairs, or recently constructed nests by new golden eagle pairs. All active primary and alternate nests will be preserved.

If new golden eagle nests of new eagle pairs are located, a nest-specific analysis will be prepared to identify the primary nest and establish its viewshed (the "Viewshed"). Based on the known behavior of golden eagles to construct alternate tree nests within relatively close proximity to each other, often within the same stand or grove of trees, alternate nest sites will generally be protected by the same viewshed analysis as applied to primary active nests. Regardless, because suitable nest habitat for alternate nest sites exist within the viewshed of the primary nest (as evidenced by the three known existing nest sites), even if alternate nests do not occur within the existing established viewshed areas of known primary nests, adequate nesting and foraging habitat would be preserved within the viewshed protection areas for those primary nests such that the integrity of the existing eagle nest territories are expected to be preserved and continue to be active. Further, active alternate nests will not be removed and avoidance and minimization measures for primary and alternate nests apply as set forth in Section 7.1.1.2.4.

6.2.2.4.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO GOLDEN EAGLE

The golden eagle primarily occurs in the western regions of North America and breeds locally from Alaska southward to northern Baja California, Mexico, northern central Mexico, and eastward to the western Great Plains. Although recent population estimates are lacking, Olendorff et al. (1981) estimated over 63,000 wintering individuals in 16 western states. Braun et al. (1975) estimated over 100,000 individuals in North America in the 1970s. Estimates of breeding pairs in two western states include 1,200 in Nevada (Herron et al. 1985) and 500 in California (Thelander 1974). Because there are no defined discrete "core" populations of golden eagles in California and suitable habitat for this species is more or less contiguous between California and neighboring areas, the scale for analyzing impacts of the take of golden eagle, from both a habitat and species perspective, includes the entire range of the species in the western United States.

Surveys in the TMV Planning Area documented four golden eagle nest sites, three of which were active in 2007 (Dudek 2009). Numerous foraging and soaring observations were also made during the 2007 surveys. Based on these surveys, the golden eagle is expected to occur throughout Covered Lands in suitable habitat.

Covered Activities would result in the permanent loss of 7,698 acres (7%) of modeled suitable habitat for golden eagle within Covered Lands, including 2,045 acres (6%) of modeled breeding/foraging habitat, 3,040 acres (9%) of modeled foraging habitat, and 2,613 acres (5%) of modeled primary breeding habitat. Based on documented home range sizes of this species, on the density of nesting pairs observed in the TMV Planning Area, and assuming saturation of all modeled suitable habitat, this would amount to a potential loss of habitat potentially supporting one nesting pair. Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 45,357 acres (95%) of modeled primary breeding habitat, 30,972 acres (94%) of modeled breeding/foraging habitat, and 30,791 acres (91%) of modeled foraging habitat for this species within Covered Lands. Assuming that home range sizes of nesting golden eagles on the ranch are, as discussed previously, at the lower end of range size estimates given in the literature (i.e., 5,000 to 8,000 acres), the conservation of 30,972 acres of modeled breeding/foraging habitat and 30,791 acres of modeled foraging habitat is considered more than adequate to support the three known active nest territories within the TMV Planning Area, as well as several additional territories that may occur within Covered Lands. Assuming home ranges of 5,000 to 8,000 acres, conservation of 61,763 acres of modeled breeding/foraging and modeled foraging habitat could support an estimated 8 to 12 pairs on Covered Lands. No lethal take of golden eagle under the FESA, Migratory Bird Treaty Act (MBTA), or BGEPA would occur. All known active golden eagle nest sites on site would be conserved.

With this substantial conservation of modeled primary breeding, breeding/foraging, and foraging habitat in a large, unfragmented open space system, adequate modeled habitat would be conserved in Covered Lands to continue to support breeding pairs of the golden eagle on site. In addition, specific avoidance and minimization measures will be implemented to address the potential that active nest sites are disturbed or abandoned. These measures include development and disturbance setbacks from all known active eagle nests; surveys for newly established eagle nests (including active alternate nests); development of a pre-construction viewshed analysis on all newly located nests within 1.0 mile of anticipated grading activity; implementation of viewshed setbacks and protocols to avoid direct and indirect impacts to existing/known active nests and any newly established active nests (including active alternative nests) and associated foraging habitat; lighting directed away from suitable nesting/foraging habitat; reduction of cattle-related impacts on nesting/foraging habitat; and the distribution of educational information to avoid/minimize recreational impacts. These measures, together with the preservation of the vast majority of modeled primary breeding/foraging habitat for golden eagles within Covered Lands, are, pursuant to BGEPA, compatible with the preservation of golden eagles and consistent with the goal of maintaining stable breeding populations. Further, under BGEPA, habitat loss or loss of future breeding potential does not equate to a take because BGEPA is not a habitat management law, and with the measures described, no lethal take or "disturbance" of bald eagle individuals would occur as a result of Covered Activities.

The golden eagle occurs throughout western North America, from Alaska to northern Mexico, with an estimated number of up to 100,000 individuals (Braun et al. 1975; Olendorff et al. 1981). This species occurs throughout California, occupying all but the Central Valley, southeastern desert region, and Los Angeles basin. Therefore, as a result of the conservation and avoidance/minimization measures, the presence and use of the Covered Lands by the golden eagle will not be substantially reduced by the Covered Activities nor would they substantially reduce the species within its broader range in California and the western United States.

6.2.2.5 LEAST BELL'S VIREO

6.2.2.5.1 DISCUSSION OF POTENTIAL TAKE OF LEAST BELL'S VIREO

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled breeding/foraging habitat for least Bell's vireo (*Vireo bellii pusillus)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-10* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.5.1, least Bell's vireo territory ranges in size from 0.5 to 7.4 acres (Kus 1992), with most averaging between 0.7 and 2.5 acres (USFWS 1998). Assuming a territory size of 2 acres, a uniform, non-overlapping distribution of individuals, and saturation of the entire 8 acres of modeled suitable habitat anticipated to be permanently lost, habitat reduction associated with this TU MSHCP could result in the loss of habitat supporting up to two active breeding territories.

This estimate is considered to be high for two main reasons. First, as stated in Section 5.2.2.5.3, protocol survey results for the least Bell's vireo in suitable habitat within the TMV Planning Area were negative, indicating that this species, if present, does not occur on the Covered Lands at a saturation level. Second, vegetation mapping in 2007 for the TMV Planning Area, as described in Section 5.1, as well as the protocol surveys for the species, did not identify substantial polygons of modeled suitable habitat containing the type of vegetation structure that typically supports breeding populations of the least Bell's vireo (see Section 5.2.2.5.2). Thus, the estimate that two active breeding territories within the 8 acres of permanently lost modeled suitable habitat would be affected is considered to be high. A more reasonable estimate would be to assume that the 8 acres to be permanently lost could support one or two active least Bell's vireo breeding territories because not all modeled suitable habitat is expected to be occupied for the reasons given above. Also, because the riparian vegetation on the Covered Lands does not have the typical structure required by the least Bell's vireo, it is likely that if the species occurs on site, its territories would be larger than 2 acres. The potential impact to up to two active breeding territories by Covered Activities would be further reduced with application of avoidance and minimization measures identified for this species in Section 7.1.1.2.5 of this TU MSHCP, including pre-construction surveys and avoidance of construction during the breeding season if nesting vireos are observed, or appropriate setbacks or noise-attenuating measure(s) if construction must take place.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on least Bell's vireo include impacts to water quality and noise levels.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on least Bell's vireo include lighting effects.

Other Covered Activities with potential non-permanent effects on least Bell's vireo individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled breeding/foraging habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.5.

6.2.2.5.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO LEAST BELL'S VIREO

The least Bell's vireo is nearly endemic to California, with its known historical range extending from northern Baja California, Mexico, north to the Sacramento and San Joaquin valleys west of the Sierra Nevada. With the exception of a few scattered locations, breeding populations of the least Bell's vireo currently occur in Southern California south of the Tehachapi Mountains, and is not known to presently occur in Kern County. According to the USFWS (2006a), there are about 3,000 territories within 9 California counties. Major breeding populations occur along the Santa Clara, Santa Ana, Santa Margarita, San Luis Rey, and Tijuana rivers. The Covered Lands are situated just north of its known current range in Southern California.

Critical habitat is designated for vireo in occupied areas identified as essential to supporting the recovery of the species. No critical habitat for vireo is designated within or adjacent to the Covered Lands.

Protocol surveys for the least Bell's vireo conducted in the TMV Planning Area in 2007 were negative and the potential for the species to nest on Covered Lands is considered to be low. However, modeled breeding habitat occurs on site and the potential for the species to nest on Covered Lands in the future cannot be dismissed.

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled breeding/foraging habitat for least Bell's vireo within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled breeding/foraging habitat, this would amount to a potential loss of habitat supporting up to four active breeding territories. However, based on the negative survey results within a portion of the Covered Lands, current distribution data, and because not all modeled habitat is expected to be occupied by this species, it is estimated that there could be modeled habitat loss resulting in the loss of no more than one or two active breeding territories prior to implementation of avoidance and minimization measures. The potential impacts to active nests and breeding territories would be further reduced with the application of all avoidance and minimization measures (pre-construction surveys, avoidance and setbacks to protect breeding vireos).

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 582 acres (95%) of modeled breeding/foraging habitat for this species within Covered Lands.

With this level of conservation, adequate modeled breeding/foraging habitat would be conserved on site within a large, unfragmented open space system to support any future breeding least Bell's vireo. In addition, this species' breeding range is broad, extending from Sacramento and the San Joaquin Valley south to northern Baja California, Mexico, with the vast majority of breeding locations in Southern California. Rangewide, the loss of a maximum of two active breeding territories prior to implementation of avoidance and minimization measures represents about 0.07% of the estimated 2,968 breeding territories (USFWS 2006a). The permanent loss of 1% of modeled breeding/foraging habitat for least Bell's vireo within Covered Lands resulting from permanent habitat loss associated with Covered Activities would not substantially affect the future use of Covered Lands for breeding and foraging by the species nor would it substantially affect the species within its breeding range.

6.2.2.6 LITTLE WILLOW FLYCATCHER

6.2.2.6.1 DISCUSSION OF POTENTIAL TAKE OF LITTLE WILLOW FLYCATCHER

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled foraging/winter stopover habitat for little willow flycatcher (*Empidonax traillii brewsteri*) within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-11* and *Appendix D* for description of methods used to develop the model). The little willow flycatcher is not expected to breed on Covered Lands, thus no impacts would occur to breeding pairs. As stated in Section 5.2.2.6.1, the little willow flycatcher breeds in California from Tulare County north along the western side of the Sierra Nevada and Cascades, extending to the coast in northern California. It is a rare to locally uncommon summer resident from 1,969 to 8,005 feet amsl, and a common spring (mid-May to early June) and fall (mid-August to early September) migrant at lower elevations throughout the state, exclusive of the north coast (Zeiner et al. 1990b). Most of the remaining breeding populations occur in isolated mountain meadows of the Sierra Nevada and Cascades (Sanders and Flett 1989). Also, as stated in Section 5.2.2.6.3, foraging willow flycatchers were observed in the TMV Planning Area during protocol surveys for southwestern willow flycatcher and least Bell's vireo (Dudek 2009). These individuals were determined to most likely be little willow flycatchers due to the timing of the observations; they were observed during the first two protocol survey periods in 2007 but were absent during the third protocol survey period, indicating that they were using the site during migration. No willow flycatchers were observed nesting in the TMV Planning Area and none are expected to nest on Covered Lands.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on little willow flycatcher include impacts to water quality.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on little willow flycatcher include lighting effects.

Other Covered Activities with potential non-permanent effects on little willow flycatcher individuals and/or modeled foraging/winter stopover habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading foraging/winter stopover habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.6.

6.2.2.6.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO LITTLE WILLOW FLYCATCHER

The little willow flycatcher breeds in California from Tulare County north along the western side of the Sierra Nevada and Cascades, extending to the coast in northern California (Craig and Williams 1998), but migrates across Southern California. Due to the lack of information in the CNDDB regarding the little willow flycatcher, the closest known breeding population of the little willow flycatcher to the Covered Lands is assumed to be just north in Tulare County, along the western side of the Sierra Nevada approximately 60 miles north of the Covered Lands. Current information suggests that there may be as few as 100 breeding territories of little willow flycatchers within the entire range of the species (based on information provided in Craig and Williams 1998), and is used as the index for the magnitude of the number of individuals that may migrate through the Covered Lands.

Several foraging willow flycatchers were observed during the first two site visits during protocol surveys for the southwestern willow flycatcher conducted in 2007 in the TMV Planning Area. About 11 individuals were observed during the first protocol survey and fewer individuals were observed during the second protocol survey. Willow flycatchers were absent during the third protocol survey and no willow flycatchers were observed nesting. The willow flycatchers observed on site are assumed to be the little willow flycatcher subspecies. For this reason, impacts are considered in the context of effects on suitable foraging/winter stopover habitat for several individuals. With only up to 100 breeding pairs of little willow flycatcher overall, it is unlikely that substantially more than the maximum of 11 individuals observed in 2007 would occur on site unless there was a dramatic increase in the breeding population.

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled foraging/winter stopover habitat for little willow flycatcher within Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 954 acres (97%) of modeled foraging/winter stopover habitat for this species within Covered Lands.

This level of conservation would provide adequate foraging/winter stopover habitat for the little willow flycatcher in a large, unfragmented open space system to support the several individuals expected to use the Covered Lands during migration each spring. In addition, this subspecies, which nests just north of Tulare County west of the Sierra Nevada, migrates across Southern California. The Covered Lands, therefore, are not a critical stopover site for migrating individuals. Based on 2007 surveys, it is estimated that approximately 10 to 15 individuals typically use the site at any given time during migration and these levels are not expected to be substantially reduced by the 1% reduction of modeled foraging/winter stopover habitat within Covered Lands. Further, the little willow flycatcher within its range would not be substantially affected because of its broad migration pattern and because its breeding habitat is located north of Tulare County.

6.2.2.7 PURPLE MARTIN

6.2.2.7.1 DISCUSSION OF POTENTIAL TAKE OF PURPLE MARTIN

Covered Activities would result in the permanent loss of 4,762 acres (6%) of modeled breeding/foraging habitat for purple martin (*Progne subis)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-12* and *Appendix D* for description of methods used to develop the model). Surveys of the TMV Planning Area yielded an estimate of 5 to 10 purple martin breeding pairs in a total of 16,848 acres of modeled suitable habitat; that is, a range of 1,685 to 3,370 acres per active territory/breeding pair. Assuming a similar density and distribution of active territories/breeding pairs on the 85,870 acres of modeled breeding/foraging habitat on Covered Lands, Covered Lands could support 25 to 50 breeding pairs. This estimate is consistent with a recent estimate of 100 to 200 pairs in the Tehachapi Mountains (Airola and Williams 2008). In 1982, the southern Tejon Ranch/Grapevine area supported between approximately 40 and 100 pairs of purple martins (Airola and Williams 2008). At a range of 1,685 to 3,370 acres per pair, it is estimated that one to three active nest sites would be permanently lost with the permanent loss of 4,762 acres of modeled breeding/foraging habitat within Covered Lands. The potential impact to individuals and active nests affected by Covered Activities would be avoided with application of avoidance and minimization measures identified for this species in Section 7.1.1.2.7 of this TU MSHCP, including pre-construction surveys and avoidance of construction during the breeding season if nesting purple martins are observed.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on purple martin include impacts to water quality.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on purple martin include lighting effects.

Other Covered Activities with potential non-permanent effects on purple martin individuals and/or modeled breeding/foraging habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled breeding/foraging habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.7.

6.2.2.7.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO PURPLE MARTIN

The purple martin primarily occurs from British Columbia in the north, east to Nova Scotia, and south to Baja California, central Mexico, and the Gulf Coast. Although the species' winter range is not well known, the species primarily winters in Amazonia and south-central Brazil (AOU 1998). The western population of purple martin, which is the basis for this impacts of take analysis, and as described by the Western Purple Martin Working Group (2005), includes breeding purple martins in California, Oregon, Washington, and British Columbia. The current population estimate for the western population of purple martins is approximately 3,500 pairs, which includes approximately 1,300 pairs in California (Western Purple Martin Working Group 2005).

Approximately 5 to 10 pairs of purple martins were observed in the TMV Planning Area in 2007, and it is expected to occur in suitable habitat throughout Covered Lands.

Covered Activities would result in the permanent loss of 4,762 acres (6%) of modeled breeding/foraging habitat for purple martin within Covered Lands. Assuming a similar density and distribution of active territories on Covered Lands as was observed in the TMV Planning Area, Covered Lands could support 25 to 50 breeding territories/pairs. It is estimated that one or two active nest sites could be permanently lost prior to application of avoidance and minimization measures to protect individuals and active nests. After application of all avoidance and minimization measures (pre-construction surveys, avoidance during breeding season), there would be no permanent loss of purple martin individuals or active nests.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 81,015 acres (94%) of modeled breeding/foraging habitat for this species within Covered Lands.

This level of conservation would provide adequate modeled breeding/foraging habitat in a large, unfragmented open space system for an estimated 23 to 48 breeding territories/pairs of purple martins on Covered Lands (e.g., there were 5 to 10 pairs within the TMV Planning Area alone). This species has a large breeding range in North America and an estimated breeding population in the western states of California, Oregon, and Washington and British Columbia of 3,500 pairs, with 1,300 pairs in California (Western Purple Martin Working Group 2005; Airola and Williams 2008). Therefore, the loss of no more than three active nest sites would not substantially affect the purple martin's presence on Covered Lands. Further, the loss of no more than three active nests represents about 0.2% of the estimated 1,300 pairs in California and about 0.09% of the estimated 3,500 pairs in the western population. The permanent loss of 6% of modeled breeding/foraging habitat for the purple martin within Covered Lands resulting from permanent habitat loss associated with Covered Activities would not substantially affect the future use of Covered Lands for breeding and foraging by the species nor would it substantially affect the species within California or within the western population.

6.2.2.8 SOUTHWESTERN WILLOW FLYCATCHER

6.2.2.8.1 DISCUSSION OF POTENTIAL TAKE OF SOUTHWESTERN WILLOW FLYCATCHER

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled breeding/foraging habitat for southwestern willow flycatcher (*Empidonax traillii extimus)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-13* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.8.1, southwestern willow flycatcher territory sizes range from 0.25 to 5.7 acres, with most territories ranging from 0.5 to 1.2 acres (USFWS 2002c). In addition, flycatchers often cluster their territories into small portions within a riparian site and major portions of the site may be occupied irregularly or not at all (USFWS 2002c). Assuming a territory size of 1 acre, a uniform, non-overlapping distribution of individuals, and saturation of the entire 8 acres of modeled suitable habitat anticipated to be permanently lost, habitat reduction associated with this TU MSHCP could result in the loss of habitat supporting up to eight territories.

This estimate is considered to be high for two main reasons. First, as stated in Section 5.2.2.8.3, protocol survey results for the southwestern willow flycatcher in suitable habitat within the TMV Planning Area were negative, indicating that this species, if present, does not occur on the Covered Lands at a saturation level. Also, as noted above, this species also tends to cluster its territories in small portions of a riparian site. Second, vegetation mapping in 2007 for the TMV Planning Area, as described in Section 5.1, as well as the protocol surveys for the species, did not identify substantial polygons of modeled breeding/foraging habitat containing the type of vegetation structure that typically supports breeding populations of the southwestern willow flycatcher (see Section 5.2.2.8.2). Thus, the estimate that eight territories within the 8 acres of permanently lost modeled breeding/foraging habitat would be affected is considered to be high. A more reasonable estimate would be to assume that the 8 acres to be permanently lost could support one or two breeding territories of southwestern willow flycatcher because not all modeled breeding/foraging habitat is expected to be occupied for the reasons given above. Also, because the riparian vegetation on the Covered Lands does not have the typical structure required by the southwestern willow flycatcher, it is likely that if the species occurs on site, its territories would be larger than 1 acre. The potential impact to up to two active breeding territories by Covered Activities would be further reduced with application of avoidance and minimization measures identified for this species in Section 7.1.1.2.8 of this TU MSHCP, including pre-construction surveys and avoidance of construction during the breeding season if nesting southwestern willow flycatchers are observed, or appropriate setbacks or noise-attenuating measure(s) if construction must take place.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on southwestern willow flycatcher include impacts to water quality and noise levels.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on southwestern willow flycatcher include lighting effects.

Other Covered Activities with potential non-permanent effects on southwestern willow flycatcher individuals and/or modeled breeding/foraging habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled breeding/foraging habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.8.

6.2.2.8.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO SOUTHWESTERN WILLOW FLYCATCHER

The southwestern willow flycatcher breeding range includes Southern California, southern Nevada, Arizona, and New Mexico (Garrett and Dunn 1981). Its breeding distribution is relatively small, isolated, and broadly scattered (USFWS 2002c). Based on the most recent estimate for breeding sites and territories, there were approximately 1,299 documented territories rangewide and approximately 172 territories in California (Durst et al. 2008). Critical habitat is designated for southwestern willow flycatcher in occupied areas identified as essential to supporting the recovery of the species. No critical habitat for southwestern willow flycatcher is designated within or adjacent to the Covered Lands.

Several foraging willow flycatchers were observed during the first two site visits during protocol surveys for the southwestern willow flycatcher conducted in 2007 in the TMV Planning Area (Dudek 2009). About 11 individuals were observed during the first protocol survey and fewer individuals were observed during the second protocol survey. Willow flycatchers were absent during the third protocol survey and no willow flycatchers were observed nesting. For this reason, the willow flycatchers observed on site are assumed to be the little willow flycatcher subspecies and not the southwestern willow flycatcher subspecies. The potential for southwestern willow flycatcher to nest on site is considered to be low, but its potential to nest on site in the future cannot be dismissed.

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled breeding/foraging habitat for southwestern willow flycatcher within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled breeding/foraging habitat, this would amount to a potential loss of modeled breeding/foraging habitat supporting up to eight breeding territories. However, based on the negative survey results within a portion of the Covered Lands, current distribution data for this species, and because not all modeled breeding/foraging habitat is expected to be occupied by this species, it is estimated that there could be habitat loss potentially supporting no more than one or two active breeding territories of southwestern willow flycatcher, if they occurred within Covered Lands, prior to implementation of avoidance and minimization measures. The impacts to nest sites and breeding territories would be further reduced with the application of all avoidance and minimization measures (pre-construction surveys and avoidance and setbacks to protect breeding southwestern willow flycatchers).

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 954 acres (97%) of modeled breeding/foraging habitat for this species within Covered Lands.

With this level of conservation, adequate modeled breeding/foraging habitat would be conserved on site in a large, unfragmented open space system to support any future breeding southwestern willow flycatchers. In addition, the current known breeding range of this subspecies does not extend north to the Covered Lands, with known breeding locations limited to Southern California, southern Nevada, Arizona, and New Mexico (Garrett and Dunn 1981). Nonetheless, rangewide, the loss of a maximum of two breeding territories represents about 0.15% of the estimated 1,299 breeding territories rangewide and 1.16% of the estimated 172 breeding territories in California (Durst et al. 2008). The permanent loss of 1% of modeled breeding/foraging habitat for southwestern willow flycatcher within Covered Lands resulting from permanent habitat loss associated with Covered Activities would not substantially affect the future use of Covered Lands for breeding and foraging by the species nor would it substantially affect the species within its breeding range.

6.2.2.9 TRICOLORED BLACKBIRD

6.2.2.9.1 DISCUSSION OF POTENTIAL TAKE OF TRICOLORED BLACKBIRD

Covered Activities would result in the permanent loss of 1,130 acres (6%) of modeled suitable habitat for tricolored blackbird (*Agelaius tricolor)* within Covered Lands, including 1,107 acres (6%) of modeled foraging habitat and 23 acres (8%) of modeled primary breeding habitat, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-14* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.9.3, the tricolored blackbird has been observed nesting and foraging in the southwestern portion of the TMV Planning Area around Castac Lake; the observed population was approximately 15 individuals. As described in Section 5.2.2.9.1, tricolored blackbirds nest in colonies, unlike many species whose breeding sites are well-spaced. Certain disturbances may result in the abandonment of the entire colony (Beedy and Hamilton 1999). For this reason, the breeding site unit of analysis for the tricolored blackbird is the entire colony location as opposed to individual nest sites. All 289 acres of modeled primary breeding habitat are in the TMV Planning Area, so it is very unlikely that breeding colonies occur on other portions of Covered Lands. Because there was one breeding colony observed on site, the permanent loss of 23 acres of primary breeding habitat within Covered Lands would result in the potential loss of one active nesting colony of tricolored blackbird. The potential loss of one colony would be minimized through the avoidance and minimization measures identified for this species in Section 7.1.1.2.9 of this TU MSHCP, including pre-construction surveys and avoidance of construction if nesting tricolored blackbirds are observed, or appropriate setbacks or noise-attenuating measure(s) if construction must take place.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on tricolored blackbird include impacts to water quality, noise levels, inadvertent impacts to modeled suitable habitat outside of designated project disturbance zones, impacts to individuals outside of designated project disturbance zones, and impacts to individuals wandering into disturbance zones following commencement of construction activities.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on tricolored blackbird include lighting effects.

Other Covered Activities with potential non-permanent effects on tricolored blackbird individuals and/or modeled suitable habitat include cattle-related impacts (e.g., overgrazing, congregating in, trampling, and otherwise degrading modeled foraging and primary breeding habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, use of pesticides, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.9.

6.2.2.9.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO TRICOLORED BLACKBIRD

Tricolored blackbirds primarily occur in California (approximately 95% of the species (The Tricolored Working Group 2007)), but their range covers portions of Oregon and Washington, eastern Nevada, and northern Baja California, as well as central Mexico (Beedy and Hamilton 1999). Populations in California have been restricted to the Central Valley and surrounding foothills, coastal, and some inland localities in Southern California. Within California, the tricolored blackbird breeds locally west of the Cascade Range, Sierra Nevada, and southeastern deserts, from Humboldt and Shasta counties south to extreme southwestern San Bernardino County, western Riverside County, and western and southern San Diego County. In central

California, breeding extends east into the foothills of the Sierra Nevada. It also breeds in the marshes of Klamath Basin in Siskiyou and Modoc counties and Honey Lake Basin in Lassen County (Beedy and Hamilton 1999). The most recent census of the tricolored blackbird population in 2005 estimates a population of approximately 260,000 in California (The Tricolored Working Group 2007).

A small population of tricolored blackbirds numbering about 15 individuals was observed foraging and nesting in the southwestern portion of the TMV Planning Area around Castac Lake in 2007. The tricolored blackbird is considered to have a high potential to forage elsewhere within modeled suitable habitat on non-surveyed portions of Covered Lands, but because modeled suitable wetland breeding habitat is limited, it is considered to have very low potential to nest on Covered Lands outside of the TMV Planning Area.

Covered Activities would result in the permanent loss of 1,130 acres (6%) of modeled suitable habitat for tricolored blackbird within Covered Lands, including 1,107 acres (6%) of modeled foraging habitat and 23 acres (8%) of modeled primary breeding habitat. Based on the TMV 2007 survey, which includes modeled suitable breeding habitat with the highest potential for a breeding colony on Covered Lands, it is estimated that one colony of tricolored blackbird could be affected by Covered Activities prior to implementation of avoidance and minimization measures. The potential for the loss of one nesting colony would be reduced with application of all avoidance and minimization measures (pre-construction surveys, avoidance and setbacks to protect the breeding colony).

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 17,373 acres (94%) of modeled foraging habitat and 198 acres (68%) of modeled primary breeding habitat for this species within Covered Lands.

With this level of conservation, adequate modeled foraging habitat and modeled breeding habitat would be conserved on site in a large, unfragmented open space system to support the observed small breeding population and additional small breeding populations. In addition, this species is still widespread in California in the Central Valley, the Central Coast region, and the coastal and desert regions of Southern California. The estimated population in California in 2005 was approximately 260,000 (The Tricolored Working Group 2007). Therefore, the loss of one potential small nesting colony of similar size to that observed in the TMV Planning Area (approximately 15 individuals) would represent 0.006% of the total estimated population in California. Covered Activities would not substantially affect the future use of Covered Lands for foraging and breeding by tricolored blackbirds nor would they substantially affect the species within its California range.

6.2.2.10 WESTERN YELLOW-BILLED CUCKOO

6.2.2.10.1 DISCUSSION OF POTENTIAL TAKE OF WESTERN YELLOW-BILLED CUCKOO

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled breeding/foraging habitat for western yellow-billed cuckoo (*Coccyzus americanus occidentalis)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-15* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.10.1, western yellow-billed cuckoo home ranges are quite large at 20 to 100 acres or more of riparian habitat (Gaines 1974; Laymon and Halterman 1987). Home ranges in the south fork of the Kern River averaged about 42 acres (Laymon et al. 1993). Assuming a minimum territory size of 20 acres, the permanent loss of 8 acres of modeled breeding/foraging habitat within Covered Lands would result in the loss of modeled habitat supporting at most one breeding territory of the western yellow-billed cuckoo.

This estimate is considered to be high for two reasons. First, focused surveys in the TMV Planning Area were negative for this species (Dudek 2009). Second, TMV vegetation mapping did not identify areas with appropriate patch size or configuration likely to support breeding territories, and it was concluded that the potential for western yellow-billed cuckoo to nest or forage in the TMV Planning Area is very low. Further, the permanent loss of active nests and breeding territories would be avoided through the avoidance and minimization measures identified for this species in Section 7.1.1.2.10 of this TU MSHCP, including pre-construction surveys and avoidance of construction if nesting cuckoos are observed, or appropriate setbacks or noise-attenuating measure(s) if construction must take place.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on western yellow-billed cuckoo include impacts to water quality and noise levels.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on western yellow-billed cuckoo include lighting effects.

Other Covered Activities with potential non-permanent effects on western yellow-billed cuckoo individuals and/or modeled breeding/foraging habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled breeding/foraging habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.10.

6.2.2.10.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO WESTERN YELLOW-BILLED CUCKOO

The yellow-billed cuckoo full species summers and nests from interior California east to New Brunswick, Canada, and sporadically southward to southern Mexico. The species presumably migrates throughout much of North America and winters primarily from northern to central South America (AOU 1998). Within California, the western yellow-billed cuckoo subspecies is an uncommon to rare summer resident of valley foothill and desert riparian habitats in scattered locations (Zeiner et al. 1990b). It breeds along the Colorado River; in the Sacramento and Owens valleys; along the South Fork of the Kern River, Kern County; along the Santa Ana River, Riverside County; and along the Amargosa River, Inyo and San Bernardino counties (Zeiner et al. 1990b). The Covered Lands are situated in the central portion of the known current range for western yellow-billed cuckoo in California. There has not been a systematic statewide survey of western yellow-billed cuckoo in California since 1987, but the most recent estimate showed a decline of 123 to 163 pairs in 1977 to 30 to 33 pairs in 1987, or a 73% to 82% decline over this 10-year time period (Laymon 1998).

Focused surveys for western yellow-billed cuckoo in the TMV Planning Area in 2007 were negative and the vegetation mapping for the TMV Planning Area indicates that the site does not support areas with appropriate patch size or configuration to support breeding pairs of this species. On the remainder of Covered Lands the available vegetation data did not allow for such a refined analysis of patch size and configuration, but due to the general lack large riparian zones in the TMV Planning Area, it is assumed that the potential for the western yellow-billed cuckoo to nest or forage on Covered Lands overall is very low. However, the potential for the species to nest or forage on Covered Lands cannot be completely dismissed.

Covered Activities would result in the permanent loss of 8 acres (1%) of modeled breeding/foraging habitat for western yellow-billed cuckoo within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled breeding/foraging habitat, this would amount to a potential loss of habitat supporting one or two breeding territories. Based on the negative survey results within a portion of the Covered Lands, current distribution data for this species, and because not all modeled breeding/foraging habitat is expected to be occupied by this species, it is estimated that there could be habitat loss potentially supporting one western yellow-billed cuckoo breeding territory, if occurring within Covered Lands, prior to application of avoidance and minimization measures to protect individuals and active nests. After application of all avoidance and minimization measures (pre-construction surveys, avoidance during breeding season), there would be no permanent loss of western yellow-billed cuckoo individuals or active nests.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 954 acres (97%) of modeled breeding/foraging habitat for this species within Covered Lands.

With this level of conservation, adequate modeled breeding/foraging habitat would be conserved on site in a large, unfragmented open space system to support any future breeding pairs of the western yellow-billed cuckoo. The species breeds throughout the eastern United States and the western subspecies nests locally in scattered locations throughout California, including along the Colorado River; in the Sacramento and Owens valleys; along the South Fork of the Kern River, Kern County; along the Santa Ana River, Riverside County; and along the Amargosa River, Inyo and San Bernardino counties (Zeiner et al. 1990b). The potential loss of one breeding territory would represent about 3.0% to 3.3% of the 30 to 33 pairs estimated in 1987 (Laymon 1998). The permanent loss of 1% of modeled breeding/foraging habitat for western yellow-billed cuckoo within Covered Lands resulting from permanent habitat loss associated with Covered Activities would not substantially affect the future use of Covered Lands for breeding and foraging by the species nor would it substantially affect the species within its California range.

6.2.2.11 WHITE-TAILED KITE

6.2.2.11.1 DISCUSSION OF POTENTIAL TAKE OF WHITE-TAILED KITE

Covered Activities would result in the permanent loss of 1,874 acres (21%) of modeled foraging habitat for white-tailed kite (*Elanus leucurus)* within Covered Lands based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-16* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.11.1, the white-tailed kite forages from a central perch over areas as large as 1.9 square miles (1,216 acres) (Warner and Rudd 1975). Assuming saturation of all modeled foraging habitat, the permanent loss of 1,874 acres within Covered Lands could result in the permanent loss of one foraging range for the white-tailed kite.

As stated in Section 5.2.2.11.3, the white-tailed kite has been observed foraging in the TMV Planning Area (Dudek 2009), but, for several reasons, is not expected to nest in areas where Covered Activities would result in permanent habitat loss. Generally, the elevation of the Covered Lands is too high for this species: the species avoids areas that freeze (Dunk 1995). The Covered Lands are generally above 2,000 feet amsl on the north (San Joaquin Valley) side of the mountains and on the south (Antelope Valley) side, the elevation ranges from about 3,200 feet amsl to about 4,700 feet amsl, following the Los Angeles County line, with an average elevation of 4,100 feet amsl. CNDDB records for breeding kites range in elevation from sea level to 640 meters amsl (sea level to 2,100 feet). The TMV Project, where the large majority (88%) of habitat loss on Covered Lands would occur, ranges in elevation from 2,586 to 5,408 feet amsl, and the majority of the TMV Project is at the middle elevation range of approximately 3,400 to 4,399 feet. Although the species was observed foraging on site, non-breeding white-tailed kites are known to have nomadic movements and to respond to prey populations. In addition, they can be present within an area as a non-breeding individual and may forage miles from their roost site in response to areas that may be good for foraging (Dunk 1995). Suitable foraging habitat needs to be associated with a water source for this species (Faanes and Howard 1987). The suitable foraging habitat was modeled to represent this association using the best available information; however, based on review of the areas that were modeled as suitable, most of the drainages that were included are intermittent and would not provide the required association with a water source. The area that does provide this resource is associated with Castac Lake and Grapevine Creek where the white-tailed kite has been observed foraging. Castac Lake and Grapevine Creek will be preserved under the TU MSHCP.

Typical breeding locations for this raptor are located within a variety of species of trees that are of moderate height and near a food source, no more than approximately 1.2 miles from the foraging area (Faanes and Howard 1987). Since most of the potential grassland and marshland foraging areas are at elevations that are higher than where the white-tailed kite has been recorded and few of the foraging areas within the ecoregion are adjacent to permanent water sources, the foraging habitat would not be expected to be saturated by the white-tailed kite or used in conjunction with breeding; thus, it is likely that the Covered Lands provide suitable foraging for a portion of one foraging range. In addition, no active nest sites in the TMV Planning Area were detected and, due to the behavior of the species, nesting activity is very easily observed. For these reasons, while the potential for the white-tailed kite to forage within suitable habitat on non-surveyed portions of Covered Lands is high, this species is not expected to breed on site.

Nonetheless, impacts to the white-tailed kite can include the following. In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on white-tailed kite include impacts to water quality.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on white-tailed kite include lighting effects.

Other Covered Activities with potential non-permanent effects on white-tailed kite individuals and/or modeled suitable habitat include cattle-related impacts (e.g., overgrazing, congregating in, trampling, and otherwise degrading modeled foraging habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Because the white-tailed kite is a California Fully Protected species, avoidance and minimization measures proposed in Section 7.1.1.2.11 of this TU MSHCP are designed to address the potential impacts listed above and avoid lethal take. No white-tailed kite individuals or active nest sites would be lost in association with the permanent loss of 1,874 acres of modeled foraging habitat within Covered Lands. Measures related to commercial and residential Covered Activities include pre-grading construction surveys, establishment of a 500-foot setback around active nests, if found, and monitoring of construction activities. Measures for long-term operational Covered Activities include providing 500-foot setbacks for active nests from recreational activities during the white-tailed kite breeding season; public education and regulation of recreation through the Public Access Plan; baseline surveys to inform management; pre-disturbance surveys prior to installation of infrastructure and trails, and contractor education, staking and temporary construction fencing, if found; and siting of new public access trails in consultation with the project biologist.

6.2.2.11.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO WHITE-TAILED KITE

White-tailed kites primarily occur along the west coast and primarily within California within the coastal and valley lowlands southward to northern Baja California and northern Mexico. Few data exist on the abundance of the white-tailed kite within its United States range. Because the majority of the kite population in the United States is within California, the impacts of incidental take are analyzed, from both a habitat and species perspective, in the context of the range of the species in California. Its yearling range in California includes the entire coastal area, the Central Valley, and the irrigated agricultural areas of the Southern California desert region from the Coachella Valley south to Imperial County. Its winter range also includes the western Mojave Desert.

The white-tailed kite was observed foraging in the TMV Planning Area in 2007, but no active nest sites were observed. Modeled foraging habitat is present on Covered Lands and the potential for the species to forage within modeled foraging habitat on non-surveyed portions of Covered Lands is considered to be high for areas that are associated with a permanent water source. The Covered Lands are not within the breeding range of the species, but because white-tailed kites have been observed foraging on site, because breeding habitat elements exist on site albeit outside of the elevation at which they occur, and because this species does have nomadic movements, the potential for breeding on site cannot be dismissed. Thus, the potential for breeding on site is considered to be low.

Covered Activities would result in the permanent loss of 1,874 acres (21%) of modeled foraging habitat for white-tailed kite within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled foraging habitat, this would amount to a potential loss of habitat supporting one foraging range. Based on the fact that the potential grassland foraging areas are outside of the elevation at which the species occurs and few of the foraging areas within the modeled suitable foraging habitat are adjacent to permanent water sources, and these foraging areas are located at higher elevations than what is recorded for the species, and because not all modeled habitat is expected to be occupied by this species, it is estimated that modeled foraging habitat loss would potentially affect no more than a portion of one foraging range. All active nest sites would be conserved and no lethal take would occur as a result of application of all avoidance and minimization measures (pre-construction surveys for active nests and provision of protection zone around any active nests during construction activities).

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 7,021 acres (78%) of modeled foraging habitat for this species within Covered Lands.

With this level of conservation, adequate modeled foraging habitat would be conserved in large, unfragmented open space system on site to support white-tailed kites that currently forage on Covered Lands. In addition, this species has a broad range in California, including the entire coastal area, the Central Valley, the western Mojave Desert (winter range only), and the agricultural regions of the southern desert region from the Coachella Valley to Imperial County. The permanent loss of a portion of one foraging range within Covered Lands resulting from Covered Activities would not substantially affect the potential for the white-tailed kite to nest on site although breeding on site is unlikely. The permanent loss of 21% of modeled foraging habitat within Covered Lands resulting from permanent habitat loss associated with Covered Activities would not substantially affect the future use of Covered Lands for foraging by the species. These impacts would not substantially affect foraging by the species within its California range.

6.2.2.12 YELLOW WARBLER

6.2.2.12.1 DISCUSSION OF POTENTIAL TAKE OF YELLOW WARBLER

Covered Activities would result in the permanent loss of 2,695 acres (5%) of modeled suitable habitat for yellow warbler (*Dendroica petechia brewsteri)* within Covered Lands, including 8 acres (1%) of modeled breeding/foraging habitat and 2,687 acres (5%) of modeled secondary foraging habitat, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-17* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.2.12.1, the yellow warbler tends to have relatively small territories and home ranges, varying from 0.08 to 0.5 acre (Lowther et al. 1999), with peak densities measured in southeast Arizona reaching 119 birds per acre (Lowther et al. 1999). However, these densities are much higher than those observed in the TMV Planning Area, where surveys documented five potential breeding territories (based on singing males) in a total of 144 acres of modeled breeding/foraging habitat in the TMV Planning Area; that is, although this species may have small territories, the density observed on site was one breeding territory per 29 acres of the suitable habitat. Assuming a similar density and distribution of breeding territories on the 986 acres of modeled suitable breeding/foraging habitat on Covered Lands, the Covered Lands could support up to 34 breeding territories. At the observed density of one breeding territory per 29 acres, it is estimated that one active breeding territory would be permanently lost with the permanent loss of 8 acres of modeled breeding/foraging habitat within Covered Lands. The potential impacts to one active breeding territory and active nests by Covered Activities would be avoided with application of avoidance and minimization measures identified for this species in Section 7.1.1.2.12 of this TU MSHCP, including pre-construction surveys and avoidance of construction during the breeding season if nesting yellow warblers are observed.

In addition to the short-term construction-related impacts with potential non-permanent effects on birds noted in Section 6.2.2, short-term construction-related impacts with potential non-permanent effects on yellow warbler include impacts to water quality.

In addition to the long-term (operational) impacts with potential non-permanent effects on birds noted in Section 6.2.2, long-term (operational) impacts with potential non-permanent effects on yellow warbler include lighting effects.

Other Covered Activities with potential non-permanent effects on yellow warbler individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled breeding/foraging habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.2.12.

6.2.2.12.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO YELLOW WARBLER

The yellow warbler is a widespread species that nests across much of North America and Baja California, Mexico, and winters from the southern United States to central South America (AOU 1998). In California, the yellow warbler is an uncommon to common summer resident in the north and is locally common in the south. It breeds in riparian woodlands southward from the northern border of the state generally west of the Sierra Nevada to the coastal slopes of southern California and from coastal and desert lowlands to montane chaparral and forest habitats (Lowther et al. 1999). Regional population estimates and population declines of yellow warbler have been documented by various studies, but there is no current estimate for the rangewide population size for the species and the local abundance and long-term trends of this species vary widely by region (Heath 2008).

Five potential yellow warbler breeding territories, based on the presence of singing males, were observed in the southwestern and central portions of the TMV Planning Area in 2007 during focused surveys for the least Bell’s vireo and willow flycatcher. It is expected to breed in modeled breeding/foraging habitat throughout Covered Lands. Assuming a similar density and distribution in modeled breeding/foraging habitat as the TMV Planning Area, the Covered Lands could support up to 36 breeding territories.

Covered Activities would result in the permanent loss of 2,695 acres (5%) of modeled suitable habitat for yellow warbler within Covered Lands, including 8 acres (1%) of modeled breeding/foraging habitat and 2,687 acres (5%) of modeled secondary foraging habitat. Assuming a similar density and distribution in modeled suitable habitat in the Covered Lands as the TMV Planning Area (i.e., one breeding pair per 29 acres), it is estimated that there could be habitat loss potentially supporting no more than one breeding territory of yellow warbler prior to implementation of avoidance and minimization measures. After application of all avoidance and minimization measures (pre-construction surveys, avoidance during breeding season), there would be no permanent loss of yellow warbler individuals or active nests.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 954 acres (97%) of modeled breeding/foraging habitat and 49,008 acres (95%) of modeled secondary foraging habitat for this species within Covered Lands.

With this level of conservation, adequate modeled breeding/foraging and modeled secondary foraging habitat would be conserved in a large unfragmented open space system on site to support up to an estimated 35 breeding territories of yellow warblers on site. In addition, this species' breeding and migration range includes virtually all of North America. Its breeding range in California is very widespread and includes all coastal areas, northern California north of the Central Valley, the foothills of the Sierra Nevada, and the Great Basin Desert. The permanent loss of 1% of modeled breeding/foraging habitat, 5% of modeled secondary foraging habitat, and no more than one active breeding territory within Covered Lands, resulting from permanent habitat loss associated with Covered Activities would not substantially affect the warbler breeding population on site. Although there are no current estimates of the yellow warbler breeding population in California (Heath 2008), impacts would not substantially affect breeding populations of this species within its California range.

6.2.3 INSECTS

In addition to impacts from permanent habitat loss, other potential non-permanent effects to insects include impacts discussed below.

Short-term construction-related impacts with potential non-permanent effects on insects include impacts to water quality, dust, inadvertent impacts to modeled suitable habitat outside of designated project disturbance zones, impacts to individuals outside of designated project disturbance zones, and impacts to individuals wandering into disturbance zones following commencement of construction activities.

Water quality, as discussed above, can directly affect aquatic insects because they are intimately tied to an aquatic environment. Thus, the quality of the water in which they live can affect their growth, development, and survival. Pollutants, runoff of pesticides, waterborne pathogens, and sediment can all affect water quality and these factors can in turn affect aquatic insects. Terrestrial insects are less directly affected by changes in water quality but may be affected by the changes that water quality has on their host plant or the vegetation community in which they occur. Nutrient changes within water sources have been shown to affect the flying insect species community resulting in changes of the dominant insect taxonomic orders depending on the location with respect to the source of water quality change (Kalcounis-Rueppell et al. 2007).

Dust settling directly on the leaves of the host plants of insects may negatively affect the individual plants although current research does not support this effect for elderberry shrubs (Talley et al. 2006a). Depending on the life history of the insect species, dust may interfere with the ability of the insect to feed effectively, mate, or disperse; however, there is little information available to document actual effects. Dust can also be bound to pesticides, and the dust may then settle directly on the insect.

Long-term (operational) impacts with potential non-permanent effects on insects include exotic plant and animal species, urban runoff, and lighting effects.

As discussed above in Section 6.2.2, invasion of non-native plants has been found to modify the structure and composition of vegetation communities, and some invasive plant species have the ability to displace or replace native plant and animal species, disrupt nutrient and fire cycles, and cause changes in the pattern of plant succession. Native insect species may be threatened from exotic invasive species especially as it affects the plant community with which they are closely associated. The potential impacts of urban runoff are well documented for benthic insects, which are directly exposed to runoff and the toxins that it may contain. For terrestrial insects, the effects are more similar to other terrestrial vertebrates, with urban runoff potentially resulting in increased flooding or inundation, which could result in conversion of more upland forest habitats or riparian forest to marshland habitats, thus resulting in loss of habitat. This is especially important for species that are associated with one or a few plant species within the community. The effects of artificial light on insects are poorly documented other than for the attraction factor that light may serve to insects. This is especially well documented for moths but also occurs in other insect species. Artificial night lighting alters the natural light regimes in terrestrial and aquatic ecosystems. Besides the more obvious effects of artificial night lighting, there may be more subtle influences on the behavior and community ecology of species, including disruption of foraging and mating patterns, increased predation risk, and disruption of dispersal movements (Longcore and Rich 2004).

6.2.3.1 VALLEY ELDERBERRY LONGHORN BEETLE

6.2.3.1.1 DISCUSSION OF POTENTIAL TAKE OF VALLEY ELDERBERRY LONGHORN BEETLE

Covered Activities would result in no permanent loss of modeled suitable habitat for valley elderberry longhorn beetle (*Desmocerus californicus dimorphus)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-18* and *Appendix D* for description of methods used to develop the model).

Although no permanent loss of modeled suitable would occur, short-term (construction-related) and long-term (operational) impacts with potential non-permanent effects on insects that may occur, including to valley elderberry longhorn beetle, are noted in Section 6.2.3.

Other Covered Activities with potential non-permanent effects on valley elderberry longhorn beetle individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled suitable habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, use of pesticides, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.3.1.

6.2.3.1.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO VALLEY ELDERBERRY LONGHORN BEETLE

The valley elderberry longhorn beetle is endemic to the Central Valley of California, with its known historical range restricted to an area approximately 186 by 62 miles in the lower Sacramento and upper San Joaquin valleys (Collinge et al. 2001). Currently, the valley elderberry longhorn beetle is found from southern Shasta County south to Fresno County in the San Joaquin Valley, with approximately 190 records (mostly from exit holes) of the beetle in the Central Valley (Collinge et al. 2001; USFWS 2006b). While most of the valley elderberry longhorn beetle records are from the central to northern sections of the San Joaquin Valley, a small, distinct cluster of three occurrences is located in the southern San Joaquin Valley (CDFG 2007c). Because of the relatively small and concentrated range of valley elderberry longhorn beetle, the impacts of the incidental take of valley elderberry longhorn beetle are analyzed in the context of the entire known range of the species. However, due to the distinct cluster of occurrence records from the southern San Joaquin Valley, the impacts of incidental take of valley elderberry longhorn beetle are also analyzed in the context of the population in southern portion of the San Joaquin Valley.

Critical habitat is designated for valley elderberry longhorn beetle in occupied areas identified as essential to supporting the conservation of the species. The Covered Lands are situated just south of the current range of valley elderberry longhorn beetle (USFWS 2006b). The nearest known occurrence is located 3 miles to the north of the Covered Lands, along Caliente Creek just northwest of the mouth of Haypress Canyon (CDFG 2007c). No critical habitat for valley elderberry longhorn beetle is designated within or adjacent to the Covered Lands.

Mapped elderberry shrubs in the TMV Planning Area were surveyed in 2007 for the presence of diagnostic exit holes. This survey was negative for the presence of the valley elderberry longhorn beetle in the TMV Planning Area. The potential for this species to occur on Covered Lands is considered to be low because these surveys were negative, the northernmost edge of the Covered

Lands are 3 miles south of the southernmost documented occurrences of the species, adult valley elderberry longhorn beetles are not thought to disperse more than 164 feet (50 meters) from their emergence site (Talley et al. 2007), and the majority of Covered Lands are above the known upper elevation limit of this species. However, because there is some potential for the valley elderberry longhorn beetle to occur on Covered Lands, suitable habitat was modeled for the purpose of this analysis.

Covered Activities would not result in the permanent loss of modeled suitable habitat for valley elderberry longhorn beetle within Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 2,578 acres (99%) of modeled suitable habitat for this species within Covered Lands.

Most of the valley elderberry longhorn beetle records are from the northern and central portions of the San Joaquin Valley. The species is recorded at just three locations in the southern San Joaquin Valley. The nearest known occurrence is located 3 miles to the north of the Covered Lands, along Caliente Creek just northwest of the mouth of Haypress Canyon (CDFG 2007c). Any potential non-permanent impacts to modeled suitable associated with Covered Activities would occur at the southern edge of the range for this species, which could potentially affect the ability of the beetle to extend its range to locations within and beyond the Covered Lands. Adult valley elderberry longhorn beetles are not thought to disperse more than 164 feet (50 meters) from their emergence site (Talley et al. 2007); therefore, dispersal over that distance would not occur within a single season but could potentially occur over the long term across a number of generations. Therefore, it is conceivable that valley elderberry longhorn beetle from the Caliente Creek location could disperse south to the Covered Lands in the future.

With this level of conservation, adequate modeled suitable habitat would be conserved in a large, unfragmented open space system to support a population of the valley elderberry longhorn beetle on site, if currently present, or if the species colonizes the site in the future. With no permanent loss of modeled suitable habitat within Covered Lands, Covered Activities would not substantially affect this species on site, if present, nor preclude colonization of the site in the future.

6.2.4 MAMMALS

In addition to impacts from permanent habitat loss, other potential non-permanent effects to mammals include impacts discussed below.

Short-term construction-related impacts with potential non-permanent effects on mammals vary by individual species.

Long-term (operational) impacts with potential non-permanent effects on mammals include exotic plant and animal species (e.g., pet cats), urban runoff, and lighting effects. As discussed above in Section 6.2.2, invasion of non-native plants has been found to modify the structure and composition of vegetation communities and some invasive plant species have the ability to displace or replace native plant and animal species, disrupt nutrient and fire cycles, and cause changes in the pattern of plant succession. Native mammal populations may be threatened from exotic invasive species of animals, including pet cats, which often prey on native species. As noted above, as community organization is modified by exotic species, the native community relationships may be altered or eliminated. The potential impacts of urban runoff may result in increased flooding or inundation, which could result in conversion of more upland forest habitats to marshland habitats, thus resulting in loss of habitat for forest-dwelling species. Mammals that occur in more aquatic ecosystems or forage in aquatic ecosystems may be exposed to toxic substances in runoff or by ingesting food that has been exposed to toxins. The effects of artificial light on mammals may include disruption of foraging patterns, increased predation risk, disruption of biological clocks, increased mortality on roads, and disruption of dispersal movements (Beier 2006).

6.2.4.1 RINGTAIL

6.2.4.1.1 DISCUSSION OF POTENTIAL TAKE OF RINGTAIL

Covered Activities would result in the permanent loss of 8,287 acres (8%) of modeled suitable habitat for ringtail (*Bassariscus astutus)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-19* and *Appendix D* for description of methods used to develop the model). As described in Section 5.2.4.1.3, the habitat model is based on general features of occupied ringtail habitat and while it exclude non-suitable habitat, it cannot accurately predict occupied locations within Covered Lands. Even within suitable habitat, ringtails are generally uncommon and are distributed sporadically, occurring in varying population densities where they do occur. For example, in two California locales, densities ranged from 27 to 53 ringtails per square mile in the northern Central Valley, but only from 0.2 to 6 ringtails per square mile in chaparral in a Pacific drainage of the Sierra Nevada (Grinnell et al. 1937). Elsewhere, population densities have ranged from 4 to 7 ringtails per square mile in Zion National Park in Utah and from 6 to 11 ringtails per square mile in juniper and oak woodland habitat on the Edwards Plateau in Texas (Poglayen-Neuwall and Toweill 1988). This variability precludes generalizing from one location to another and makes it difficult to predict locations and populations at particular locale. Of the estimated 8,287 acres of permanent modeled suitable habitat loss, 6,888 acres (83%) are within the TMV Planning Area, which was specifically surveyed for the ringtail with negative results. Therefore, the potential loss of occupied territories would very small and estimated to be no more than one or two territories.

Short-term construction-related impacts with potential non-permanent effects on ringtail include impacts to water quality and dust.

Long-term (operational) impacts with potential non-permanent effects on mammals, including ringtail, are noted in Section 6.2.4. Other Covered Activities with potential non-permanent effects on ringtail individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled suitable habitat), ranch operations related to maintenance of culverts and road crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Because the ringtail is a California Fully Protected species, avoidance and minimization measures proposed in Section 7.1.1.4.1 of this TU MSHCP are designed to avoid lethal take. No ringtail individuals would be permanently lost in association with the permanent loss of 8,287 acres of modeled suitable habitat within Covered Lands. Measures related to commercial and residential Covered Activities include pre-grading construction surveys, avoidance of construction activities within 300 feet of a breeding/rearing site until it has been determined that ringtails no longer occupy the affected areas and/or that construction activities would not adversely affect the successful rearing of young, and monitoring of construction activities. Measures for long-term operational Covered Activities include public education and regulation of recreation through the Public Access Plan; baseline surveys to inform management; pre-disturbance surveys prior to installation of infrastructure and trails, and contractor education, staking and temporary construction fencing; and siting of new public access trails in consultation with the project biologist.

6.2.4.1.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO RINGTAIL

The ringtail occurs in the southwestern United States, in the states of Oregon, Nevada, Utah, Colorado, Kansas, Arizona, New Mexico, Oklahoma, and Texas, and is widely distributed in California mountain areas, where it is a common to uncommon permanent resident. Because of the continuous distribution of the species across its entire range, the impacts of incidental take of ringtail are analyzed, from both a habitat and species perspective, in the context of the species' entire range.

The Covered Lands are within the known geographic range of the ringtail. Potential ringtail scat was observed in the TMV Planning Area in 2006, but extensive camera/scent station surveys conducted throughout suitable habitat in the TMV Planning Area in 2007 yielded negative results for this species (Dudek 2009). The habitat model for the ringtail includes riparian and wetland vegetation communities, as well as springs, seeps, and intermittent stream with a 1 km (0.62 mile) buffer around such habitats. The model only can reflect habitat characteristic generally considered necessary for ringtail, but is too general to predict actual presence of ringtail on Covered Lands; i.e., if the ringtail is present on Covered Lands it most likely would occur in habitats included in the model. Although the Covered Lands include a large amount of modeled habitat, the focused surveys in the TMV Planning Area indicate that the potential for the ringtail on Covered Lands is very low, and if present, it would occur very sporadically and in very low numbers.

Covered Activities would result in the permanent loss of 8,287 acres (8%) of modeled suitable habitat for ringtail within Covered Lands. This acreage is based on the habitat suitability model developed for the ringtail. As noted above, the model can only indicate necessary habitat for the ringtail and does not accurately predict locations for the species within Covered Lands. If present, the ringtail is likely to occur in very low numbers. No lethal take of ringtail would occur. With application of all avoidance and minimization measures (pre-construction surveys, avoidance during breeding/rearing period), no ringtail individuals would be permanently lost.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 90,735 acres (91%) of modeled suitable habitat for this species within Covered Lands.

With this level of conservation, adequate modeled suitable habitat would be conserved in a large, unfragmented open space system to support the ringtail on site. In addition, this species occurs throughout the southwestern United States in California, Oregon, Nevada, Utah, Colorado, Kansas, Arizona, New Mexico, Oklahoma, and Texas. Where common in the north Central Valley, densities range from about four to eight ringtails per square mile (Poglayen-Neuwall and Toweill 1988). Therefore, the permanent loss of 8% of modeled suitable habitat within Covered Lands and no more than two territories resulting from permanent habitat loss associated with Covered Activities would not substantially affect the ringtail population on site, if present. Due to its wide distribution and common to uncommon occurrence in the southwestern United States, this loss of habitat also would not substantially affect its rangewide distribution.

6.2.4.2 TEHACHAPI POCKET MOUSE

6.2.4.2.1 DISCUSSION OF POTENTIAL TAKE OF TEHACHAPI POCKET MOUSE

Covered Activities would result in the permanent loss of 57 acres (3%) of modeled suitable habitat for Tehachapi pocket mouse (*Perognathus alticolus inexpectatus)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-20* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.4.2.1, the estimated home range for the Tehachapi pocket mouse is based on the data for the closely related Great Basin pocket mouse (*Perognathus parvus*), which is reported as ranging from 0.16 to 0.78 acre in British Columbia and south–central Washington (Howard 1996). Assuming an average home range of 0.5 acre, a uniform, non-overlapping distribution, and saturation of the entire 57 acres of modeled suitable habitat to be permanently lost, habitat reduction associated with this TU MSHCP could result in the loss of habitat supporting up to about 114 Tehachapi pocket mouse individuals.

This estimate is considered to be high for several reasons. First, as stated in Section 5.2.4.2.1, the Tehachapi pocket mouse is known from a few scattered localities in the Tehachapi Mountains, from Tehachapi Pass on the northeast to the area of Mt. Pinos on the southwest, and around Elizabeth, Hughes, and Quail lakes on the southeast. A survey of a number of historical Tehachapi pocket mouse locations in the 1980s failed to record any Tehachapi pocket mouse individuals (Laabs 2008). Second, its documented occurrence in the TMV Planning Area was limited to 2 of approximately 27 trap lines in modeled suitable habitat; that is, 7% of the traplines were occupied by Tehachapi pocket mouse. It was found only in the southeastern portion of the TMV Planning Area between Oso and Dark canyons near the southern border of the site during various surveys (see Section 5.2.4.2.3). All of the occurrences in the TMV Planning Area are within the Antelope–Fremont Valley watershed, and the trapping study indicates that this is the northerly limit of the species' range. Although the percentage of traplines occupied cannot be directly extrapolated to a percentage of modeled suitable habitat, it can be reasonably assumed that a strong positive correlation exists between the percentage of traplines in occupied habitat and the percentage of modeled suitable habitat occupied. Assuming a somewhat higher occupation rate of 10% to 15%, the number of Tehachapi pocket mouse individuals estimated to be permanently lost with the loss of the 57 acres of modeled suitable habitat within Covered Lands is 11 to 16 individuals (e.g., at 10%, 5.3 acres of habitat would be occupied with 1 individual/0.5 acre). This estimated loss would be reduced by about 60% to four to six individuals with application of avoidance and minimization measures identified for this species in Section 7.1.1.4.2, including a 5-night pre-construction live-trapping program in modeled suitable habitat within 7 days prior to commencement of ground disturbance activities and capture and release of individuals in the nearest suitable habitat outside the disturbance area.

Short-term construction-related impacts with potential non-permanent effects on Tehachapi pocket mouse include inadvertent impacts to modeled suitable habitat outside of designated project disturbance zones, impacts to individuals outside of designated project disturbance zones, and impacts to individuals wandering into disturbance zones following commencement of construction activities.

Long-term (operational) impacts with potential non-permanent effects on mammals, including Tehachapi pocket mouse, are described in Section 6.2.4. Other Covered Activities with potential non-permanent effects on Tehachapi pocket mouse individuals and/or modeled suitable habitat include cattle-related impacts (e.g., trampling of, and otherwise degrading modeled suitable habitat), ranch operations related to maintenance of roads, utility maintenance, film production, use of rodenticides, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.4.2.

6.2.4.2.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO TEHACHAPI POCKET MOUSE

Because of the relatively small and concentrated range of the Tehachapi pocket mouse, the impacts of incidental take of the species are analyzed, from both a habitat and species perspective, within the context of the small range of the species.

The Covered Lands are in the central portion of the range of the Tehachapi pocket mouse. Focused live-trapping studies were conducted in representative suitable habitat in the TMV Planning Area in 2007 and individuals were captured in the southeastern portion of the site between Oso and Dark canyons near the southern border of the site. Additionally, trapping surveys in 2010 documented the pocket mouse in the Bi-Centennial and Tri-Centennial conservation easement areas adjacent to the southeastern portion of the Covered Lands (Cypher et. al. 2010).

Covered Activities would result in the permanent loss of 57 acres (3%) modeled suitable habitat for Tehachapi pocket mouse within Covered Lands. Based on the live-trapping data for sampled traplines conducted to establish presence/absence, no documented occupied areas would be permanently impacted. However, it is assumed that the Tehachapi pocket mouse could occur in modeled suitable habitat that was not trapped and that individuals could be directly affected by Development Activities. Based on documented typical home range sizes of closely related pocket mouse species, and assuming saturation of all modeled suitable habitat, this would amount to a potential loss of habitat supporting up to 114 individuals. However, because not all modeled habitat is expected to be occupied by this species, it is estimated that 12 to 17 individuals would be permanently lost with the permanent loss of 57 acres of modeled suitable habitat within Covered Lands prior to implementation of avoidance and minimization measures. After application of all avoidance and minimization measures (pre-construction trapping program in suitable habitat, relocation of an estimated 60% of the population), it is estimated that habitat loss could result in the loss of four to six individuals.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 1,874 acres (97%) of modeled suitable habitat for this species within Covered Lands.

With this level of conservation, adequate modeled suitable habitat would be conserved within a large, unfragmented open space system on site to support the Tehachapi pocket mouse. Although no known occurrences of the species would be directly affected, it is assumed that some modeled suitable habitat that would be affected is occupied. The permanent loss of 3% of modeled suitable habitat within Covered Lands and an estimated four to six individuals resulting from permanent habitat loss associated with Covered Activities (assuming the suitable habitat is patchily occupied) would not substantially affect the Tehachapi pocket mouse population on site, if present. Pocket mouse reproduction, in general, is responsive to changing environmental conditions and females can breed in their natal season and may reproduce at least twice in a year in good conditions, resulting in the birth of several young per year (e.g., three to five offspring/litter in several pocket mouse species (Jones 1993)). Given conservation of 97% of the modeled suitable habitat, replacement and recruitment in a local population therefore can occur fairly rapidly even though pocket mice, compared to some other rodent species, are not prolific breeders. Loss of 3% of modeled suitable habitat in the Covered Lands also would not substantially affect the species in its broader range, including the Tehachapi Mountains, from Tehachapi Pass on the northeast to the area of Mt. Pinos on the southwest, and around Elizabeth, Hughes, and Quail lakes on the southeast.

6.2.5 REPTILES

In addition to impacts from permanent habitat loss, other potential non-permanent effects to reptiles include impacts discussed below.

Short-term construction-related impacts with potential non-permanent effects on reptiles vary by individual species.

Long-term (operational) impacts with potential non-permanent effects on reptiles include exotic plant and animal species and urban runoff. As discussed above, invasion of non-native plants has been found to modify the structure and composition of vegetation and has been found to have negative effects by reducing the structural and compositional diversity. Also as noted above, some invasive plant species have the ability to displace or replace native plant and animal species, disrupt nutrient and fire cycles, and cause changes in the pattern of plant succession. Native reptile populations may be threatened from exotic invasive species of animals, including Argentine ants which replace the native ant population and which are not used as a food source by some species of reptiles (Suarez et al. 2000). The potential impacts of urban runoff may result an increase in flooding or inundation, which could result in conversion of upland communities to wetlands, thus resulting in loss of habitat. Reptiles that occur in aquatic ecosystems may be exposed to toxic substances in runoff similar to amphibians as described in Section 6.2.1. An additional threat associated with increased human presence is illegal collecting for commercial or personal purposes.

6.2.5.1 COAST HORNED LIZARD

6.2.5.1.1 DISCUSSION OF POTENTIAL TAKE OF COAST HORNED LIZARD

Covered Activities would result in the permanent loss of 3,962 acres (10%) of modeled suitable habitat for coast horned lizard (*Phrynosoma blainvillii)* within Covered Lands, including 3,959 acres (10%) of modeled primary habitat and 3 acres (4%) of modeled secondary habitat, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-21* and *Appendix D* for description of methods used to develop the model). As stated in Section

5.2.5.1.1, radiotelemetry of several dozen coast horned lizards in Southern California locations over a 5-year period documented annual home range sizes of approximately 3 to 3.5 acres, with the likelihood that, across years, home range areas could be larger (Suarez, pers. comm. 2005). Assuming an average home range of 3 acres, a uniform, non-overlapping distribution, and saturation of the entire 3,962 acres of modeled suitable habitat to be permanently lost, habitat reduction associated with this TU MSHCP could result in the loss of habitat supporting up to 1,321 individuals.

This estimate is considered to be high. The 2007 survey of the TMV Planning Area, which includes approximately 13,007 acres (32%) of the total of the 41,145 acres of modeled suitable habitat on Covered Lands documented coast horned lizard in Rising Canyon, north of Castac Lake, and on a ridge above Silver Canyon (Dudek 2009). In addition, there is no information in the literature to suggest that the coast horned lizard occurs in uniform distributions and it seems to be restricted to localized populations because of its association with loose soils that have a high sand content (Jennings and Hayes 1994). Therefore, it is reasonable to assume that the number of individuals likely to be permanently lost is substantially smaller than the estimated 1,321 individuals that could be lost with the permanent loss of 3,962 acres of saturated modeled suitable habitat. However, because of its patchy distribution within its range and because it hibernates in the winter and aestivates in the warm summer months, establishing precise population densities and loss estimates of coast horned lizard individuals is difficult. The expected loss of coast horned lizards would be a small (e.g., less than 10) but indeterminable number. This loss could be further reduced with application of avoidance and minimization measures identified for this species in Section 7.1.1.5.1, including pre-construction surveys, capture and relocation of individuals, exclusion fencing, and construction monitoring. The extent to which these avoidance and minimization measures would further reduce the loss of coast horned lizard individuals would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Short-term construction-related impacts with potential non-permanent effects on coast horned lizard include inadvertent impacts to modeled suitable habitat outside of designated project disturbance zones, impacts to individuals outside of designated project disturbance zones, and impacts to individuals wandering into disturbance zones following commencement of construction activities.

Long-term (operational) impacts with potential non-permanent effects on reptiles, including coast horned lizard, are described in Section 6.2.5. Other Covered Activities with potential non-permanent effects on coast horned lizard individuals and/or modeled suitable habitat include cattle-related impacts (e.g., overgrazing, congregating in, trampling, and otherwise degrading modeled primary and secondary habitat), ranch operations related to maintenance of culverts and crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation. An additional threat associated with increased human presence is illegal collecting for commercial or personal purposes.

Conservation measures to address these threats are provided in Section 7.1.1.5.1.

6.2.5.1.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO COAST HORNED LIZARD

The coast horned lizard occurs throughout most of California in locations west of the desert and Cascade-Sierran highlands, in elevations from sea level to around 2,438 meters (8,000 feet) amsl.

The coast horned lizard was observed in Rising Canyon, north of Castac Lake, and on a ridge above Silver Canyon during the 2007 surveys conducted by Dudek (2009), and it is expected to occur in modeled suitable habitat throughout the Covered Lands (Dudek 2009).

Covered Activities would result in the permanent loss of 3,962 acres (10%) of modeled suitable habitat for coast horned lizard within Covered Lands, including 3,959 acres (10%) of modeled primary habitat and 3 acres (4%) of modeled secondary habitat. Based on documented home range sizes of this species, and assuming saturation of all modeled suitable habitat, this would amount to a potential loss of habitat supporting up to 1,321 individuals. However, based on scattered individuals observed within the TMV Planning Area and because not all modeled habitat is expected to be occupied by this species, it is reasonable to assume that the number of individuals that could be lost with the permanent loss of 3,962 acres is substantially smaller than 1,321 individuals. The expected loss of coast horned lizards is a small (e.g., less than 10) but indeterminable number. This loss could be further reduced with application of avoidance and minimization measures (pre-construction surveys, capture and relocation, exclusion fencing, and monitoring), but the success of these measures would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 37,074 acres (90%) of modeled primary habitat and 51 acres (84%) of modeled secondary habitat for this species within Covered Lands.

With this level of conservation, adequate modeled suitable habitat would be conserved in a large, unfragmented open space system on site to support the coast horned lizard. In addition, this species is still widely distributed in California, ranging south along the coastal regions from north of the San Francisco Bay area and western foothills of the Sierra Nevada, to coastal Southern California (except for the Los Angeles Basin and urbanized Orange County), including western Riverside County, southwestern San Bernardino County, and all but the easternmost portion of San Diego County. Therefore, the permanent loss of 10% of modeled primary and secondary habitat within Covered Lands and a small (e.g., less than 10) but indeterminable number of individuals resulting from permanent habitat loss associated with Covered Activities would not substantially affect the population on site nor would it substantially affect the species in its broader range within California.

6.2.5.2 TWO-STRIPED GARTER SNAKE

6.2.5.2.1 DISCUSSION OF POTENTIAL TAKE OF TWO-STRIPED GARTER SNAKE

Covered Activities would result in the permanent loss of 34 acres (9%) of modeled suitable habitat for two-striped garter snake (*Thamnophis hammondii)* within Covered Lands, based on the habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-22* and *Appendix D* for description of methods used to develop the model). As stated in Section 5.2.5.2.1, the two-striped garter snake is not territorial and summer ranges of 0.37 acre can support seven two-striped garter snakes, while the winter ranges of 0.84 acre can support three two-striped garter snakes (Zeiner et al. 1990a). Therefore, the maximum density is estimated to be about 4 individuals per acre in the winter and 19 individuals per acre in the summer. During summer, therefore, the permanent loss of 34 acres of modeled suitable habitat within Covered Lands could result in the reduction of habitat for up to about 646 individuals.

This estimate is considered to be high for several reasons. First, it is based on an estimated carrying capacity and does not necessarily reflect typical conditions. Second, it also assumes that all modeled suitable habitat has the maximum summer range carrying capacity. Third, surveys in the TMV Planning Area in modeled suitable habitat, which comprises 340 acres (94%) of the 360 acres of total suitable habitat in Covered Lands, yielded observations in Grapevine Creek, adjacent to Pastoria Creek in Beartrap Canyon, within a drainage running through Dry Field Canyon, and at an on-site stock pond south of Castac Lake (Dudek 2009). If modeled suitable habitat on Covered Lands was saturated by two-striped garter snake or the species was abundant on site, it is likely that many additional occurrences would have been recorded.

Based on the apparently low densities observed within the TMV Planning Area and because not all modeled suitable habitat is expected to be occupied by this species, the expected loss of two-striped garter snakes would be a small (e.g., less than 30) but indeterminable number. This loss could be further reduced with application of avoidance and minimization measures identified for this species in Section 7.1.1.5.2, including pre-construction surveys, capture and relocation of individuals, exclusion fencing, and/or construction monitoring. The extent to which these avoidance and minimization measures would further reduce the loss of two-striped garter snake individuals would depend on several factors, such as season and weather conditions, as this species remains underground in hibernation during the colder months (generally October through March depending on elevation and latitude).

Short-term construction-related impacts with potential non-permanent effects on two-striped garter snake include impacts to water quality and dust.

In addition to the long-term (operational) impacts with potential non-permanent effects on reptiles noted in Section 6.2.5, long-term (operational) impacts with potential non-permanent effects on two-striped garter snake include lighting effects.

Other Covered Activities with potential non-permanent effects on two-striped garter snake individuals and/or modeled suitable habitat include cattle-related impacts (e.g., congregating in, trampling, and otherwise degrading modeled suitable habitat), ranch operations related to maintenance of culverts and crossings, utility maintenance, film production, and human presence and associated passive and active recreation that could result in habitat degradation.

Conservation measures to address these threats are provided in Section 7.1.1.5.2.

6.2.5.2.2 ANALYSIS OF POTENTIAL TAKE IMPACTS TO TWO-STRIPED GARTER SNAKE

The two-striped garter snake occurs through coastal California in the vicinity of the southeast slope of the Diablo Range and the Salinas Valley south along the Coastal and Transverse Ranges to Rio Rosario in Baja California, Mexico. The western parts of the Covered Lands adjacent to Interstate 5 represent the eastern extent of the range of the two-striped garter snake. The impacts of the incidental take of the two-striped garter snake are analyzed, for both habitat and individuals, in the context of the broad range of the species.

The two-striped garter snake was observed during surveys in the TMV Planning Area in 2007 in the southwestern and central portions of the site east of Rising Canyon, in Dry Field Canyon, and in Beartrap Canyon. Almost all of the modeled suitable habitat for this species is in the TMV Planning Area.

Covered Activities would result in the permanent loss of 34 acres (9%) of modeled suitable habitat for two-striped garter snake within Covered Lands. Based on documented home range sizes of this species, and assuming saturation of all modeled suitable habitat, this would amount to a potential loss of habitat supporting up to about 646 individuals. However, it is reasonable to assume that the number of individuals that could be lost with the permanent loss of 34 acres is substantially smaller than 646 individuals. The expected loss of two-striped garter snakes is a small (e.g., less than 30) but indeterminable number. This loss could be further reduced with application of avoidance and minimization measures (pre-construction surveys, capture and relocation, exclusion fencing, and/or monitoring), but the success of these measures would depend on several factors, such as season and weather conditions, as this species remains underground for much of the year.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 254 acres (70%) of modeled suitable habitat for this species within Covered Lands.

With this level of conservation, adequate modeled suitable habitat would be conserved in a large, unfragmented open space system on site to support the two-striped garter snake, although the permanent loss of 9% of modeled suitable habitat within Covered Lands would reduce its distribution on site. However, this species is widely distributed in coastal California from the San Francisco Bay area south to Baja California, Mexico, including the southwestern portion of San Bernardino County, western Riverside County, and all but the easternmost portion of San Diego County. Furthermore, the western parts of the Covered Lands adjacent to Interstate 5 represent the eastern extent of the range of the two-striped garter snake. Therefore, the permanent loss of 34 acres of modeled suitable habitat within Covered Lands and a small (e.g., less than 30) but indeterminable number of individuals resulting from permanent habitat loss associated with Covered Activities is not considered to be a substantial effect on the species rangewide. Also, because the Covered Lands are on the eastern boundary of the species' range, the continuous north–south distribution of this species would not be affected.

6.3 ANTICIPATED EFFECTS ON COVERED PLANT SPECIES

6.3.1 FORT TEJON WOOLLY SUNFLOWER

Fort Tejon woolly sunflower (*Eriophyllum lanatum* var. *hallii)* has no Federal designation but is a California Rare Plant Rank (CRPR, previously known as the California Native Plant Society (CNPS) List) 1B.1 taxa that is considered seriously endangered in California (CDFG 2011d). In addition, it has a California Heritage Element Ranking of S1, meaning that it is critically imperiled in the state because of extreme rarity (often five or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state (CDFG 2011d).

The Fort Tejon woolly sunflower is known from the southern Tehachapi Mountains (near Fort Tejon) and the Sierra Madre Mountains in the southeastern Outer South Coast Ranges. It occurs in Kern and Santa Barbara counties (Jepson Flora Project 2011).

In the Covered Lands, Fort Tejon woolly sunflower was observed in the TMV Planning Area in the following locations: the central portion in Beartrap Canyon; in the far western portion in Rising Canyon near Interstate 5; and in the south-central portion near Poleline Ridge, Skinner Canyon, and Johnson Canyon (Dudek 2009). In total,36 areas that supported approximately 3,000 to 8,500 individuals were observed (Dudek 2009). All of these located are in the permanently protected TMV Planning Area Open Space. There are no CNDDB occurrences documented in the Covered Lands; however, there are occurrences west of Interstate 5 near Fort Tejon State Historic Park (CDFG 2011a). The largest population on 18.9 acres in Santa Barbara County had 850 individuals when last observed in 1994. The other occurrence in Los Padres National Forest had 37 plants when last observed in 1994. No number of individuals was provided for one population reported in Johnson Canyon west of Fort Tejon. The occurrence east of Johnson Canyon and north of O'Neil Canyon had an estimated 530 plants in 1987.

A habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-23* and *Appendix D* for description of methods used to develop the model). A total of 57,430 acres of suitable habitat for Fort Tejon woolly sunflower was modeled for Covered Lands. Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 52,046 acres (91%) of modeled suitable habitat for this species within Covered Lands. Covered Activities would result in the permanent loss of 5,368 acres (9%) of modeled suitable habitat for Fort Tejon woolly sunflower within Covered Lands. The 36 occurrences within the Covered Lands, representing 3,000 to 8,500 individuals, are located within the TMV Planning Area Open Space and would be preserved.

Because this species was found within the surveyed TMV Planning Area, the potential for this species to occur elsewhere within modeled suitable habitat on non-surveyed portions of Covered Lands is high. However, because it is unlikely that all modeled suitable habitat would be saturated and because it is assumed that some modeled suitable habitat may not contain microhabitat required by this species, not all modeled habitat is expected to be occupied by this species. Furthermore, because 91% of modeled habitat for the Fort Tejon woolly sunflower would be conserved and all 36 occurrences within Covered Lands would be preserved within a large, unfragmented open space system, the proposed impacts to this species as a result of Covered Activities would not substantially affect the population on site nor would it substantially affect the species in its broader range within California.

6.3.2 KUSCHE'S SANDWORT

Kusche's sandwort (*Arenaria macradenia var. kuschei*) formerly was recognized by the CNDDB and CNPS as a special-status species. Based on recent collections, in the *Flora of North America* (Hartman et al. 2005), *A. m. var. kuschei* is treated as a synonym of the more widespread *Eremogone macradenia* var. *arcuifolia*, distributed in the southern Sierra Nevada and San Gabriel Mountains. *A. m. var. kuschei* may be an extreme local variant of *E. m.* var. *arcuifolia* (Stephenson and Calcarone 1999). This taxon currently has no Federal, State, or CRPR special status.

Kusche's sandwort is limited to the western Transverse Ranges (Jepson Flora Project 2011), with the only previous known occurrences from Liebre Mountain in Los Angeles County (CDFG 2007a). Kusche's sandwort was previously only known from one indistinct collection in 1929 from Forest Camp in the Mojave Desert. This taxon was not collected again until 1994, when the plant was found near the western summit of Liebre Mountain (Ross and Boyd 1996). A study conducted in 1997 included a survey of potential habitat on Liebre Mountain and adjacent areas and located six new populations. Most of these recently discovered populations are small, both in number of individual plants and in area covered by the plants (Stephenson and Calcarone 1999).

Kusche's sandwort was observed in the Covered Lands on the TMV Planning Area in one general location that contained approximately 24 individuals among 7 separate occurrences (Dudek 2009).

A habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-24* and *Appendix D* for description of methods used to develop the model). A total of 30,505 acres of suitable habitat for Kusche's sandwort was modeled for Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 28,407 acres (93%) of modeled suitable habitat for this species within Covered Lands. Covered Activities would result in the permanent loss of 2,097 acres (7%) of modeled suitable habitat for Kusche's sandwort within Covered Lands. Approximately 16 individuals of Kusche's sandwort will be avoided in Special Management Area 6, which includes a 100-foot buffer, and the remaining eight individuals are located in TMV Planning Area open space, resulting in avoidance of 100% of the known population occurrences. It is anticipated that pre-construction surveys may identify additional Kusche's sandwort individuals that could be permanently lost.

Because this species was found within the surveyed TMV Planning Area, the potential of this species to occur elsewhere within suitable habitat on non-surveyed portions of Covered Lands is high. However, because it is unlikely that all modeled suitable habitat would be saturated and because it is assumed that some modeled habitat may not contain microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species. Furthermore, because 93% of the modeled suitable habitat for Kusche's sandwort would be conserved within a large, unfragmented open space system, the seven known occurrences within Covered Lands representing approximately 24 individuals would be avoided and conserved, and the remaining known occurrences of Kusche's sandwort would be conserved in the Angeles National Forest, the proposed impacts to this species as a result of Covered Activities would not substantially affect the population on site nor would it substantially affect the species in its broader range within California.

6.3.3 ROUND-LEAVED FILAREE

Round-leaved filaree has no Federal designation but is a CRPR 1B.1 species and is considered seriously endangered in California (CDFG 2011d). This species has a California Heritage Element Ranking of S2, indicating a very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state (CDFG 2011d).

The range of round-leaved filaree (*California macrophylla)* extends from northern Mexico to Oregon and southern Utah (CNPS 2010; Jepson Flora Project 2011). It is reported in 27 counties in California, from Lassen to San Diego. It may be extirpated from Santa Cruz Island and Butte County (CNPS 2010). Gillespie (2003) determined that 105 unique populations have been reported, with most on the eastern side of the California Coast Ranges. The Jepson Online Interchange for California Floristics (Jepson Flora Project 2011) lists the Sacramento Valley, northern San Joaquin Valley, central western California, South Coast, northern Channel Islands (i.e., Santa Cruz Island), western Transverse Range, and the Peninsular Ranges as the geographic regions in which round-leaved filaree occurs. While apparently well distributed in central and northern California, it is very rare in Southern California (Reiser 2001). It is considered scarce and declining in western Riverside County (Roberts et al. 2004).

Round-leaved filaree was observed in the southeastern portion of the Covered Lands in 11 areas within the TMV Planning Area that supported approximately 430 to 730 individuals (Dudek 2007a). The CNDDB contains 142 records for round-leaved filaree in California, of which 12 are documented from Kern County (CDFG 2011a). All 12 occurrences in Kern County are considered extant. One occurrence is on the Wind Wolves Preserve, one on publicly held land, four are on private land, and ownership on the remaining six occurrences is unknown (CDFG 2011a). In Kern County, round-leaved filaree is reported from the Temblor Range, the foothills east of Tehachapi, in the extreme southwestern Tehachapi Mountains along the northwest side of the desertous Antelope Valley, at Dry Bog Knoll, and at the head of Adobe Canyon in the Greenhorn foothills (Twisselmann 1967). Collections by Wiggins and Wolf from 1935 at the borders of Kern County have not been more recently verified (CDFG 2011a). A population of about 400 plants was reported in 2004 at Bodfish, south of Lake Isabella (CDFG 2011a).

A habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-25* and *Appendix D* for description of methods used to develop the model). A total of 58,073 acres of suitable habitat for round-leaved filaree was modeled for Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 53,076 acres (91%) of modeled suitable habitat for this species within Covered Lands. Covered Activities would result in the permanent loss of 4,997 acres (9%) of modeled suitable habitat for round-leaved filaree within Covered Lands.

Known or future detected populations of the round-leaved filaree would be conserved under two alternative scenarios: (1) three known occurrences, representing approximately 220 to 420 (52% to 58%) individuals of round-leaved filaree would be conserved within TMV Planning Area Open Space; or (2) at least three occurrences will be conserved in TMV Planning Area Open Space, including two currently known occurrences representing approximately 120 to 220 individuals and any new occurrence(s) documented within TMV Planning Area Open Space prior to development, such that the new occurrence(s) total(s) at least 100 individuals.

Under the first scenario, 8 currently known occurrences containing approximately 205 to 305 individuals would be lost. Under the second scenario, 9 currently known occurrences containing approximately 310 to 510 individuals would be lost; however, the percentage of the population lost likely would not be higher because this alternative scenario requires the documentation of new populations in the TMV Planning Area prior to development impacts and, therefore, the baseline number of individuals would be higher.

Because this species was found within the surveyed TMV Planning Area, the potential of this species to occur elsewhere within modeled suitable habitat on non-surveyed portions of Covered Lands is high. Furthermore, although the commercial and residential Covered Activities will result in loss of 205 to 305 individuals under one conservation scenario and 310 to 510 individuals under the other conservation scenario, because 91% of the modeled suitable habitat for round-leaved filaree would be conserved within a large, unfragmented open space system, and because of the relatively broad range of this species in California (i.e., in 27 counties and 105 unique populations), the proposed impacts to this species as a result of Covered Activities would preserve suitable habitat on site and would not substantially affect the species in its broader range within California.

6.3.4 STRIPED ADOBE LILY

The striped adobe lily (*Fritillaria striata)* has no Federal designation but has been listed in California as threatened since 1987. The striped adobe lily is also a CRPR 1B.1 species, and is considered seriously endangered in California (CDFG 2011d). The striped adobe lily has a California Heritage Element Ranking of S2, indicating a very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state (CDFG 2011d).

The striped adobe lily is endemic to the southern Sierra Nevada foothills of eastern Tulare and Kern counties (CDFG 2000b). The Jepson Online Interchange for California Floristics (Jepson Flora Project 2011) lists the southern Sierra Nevada, especially the Greenhorn Mountains, as the geographic region in which striped adobe lily occurs. Rare plant surveys in the TMV Planning Area in 2007 did not detect this species, although it was detected in Covered Lands in a reference location in the Old Headquarters area (Dudek 2009; Enright, pers. comm. 2011). The CNDDB contains 23 records for striped adobe lily in California (CDFG 2011), 16 of which are from Kern County. Fifteen of the populations from Kern County occur on private land and the land ownership of the other is unknown. All but one of the Kern County occurrences are considered extant. Of the seven Tulare County occurrences, three are extirpated. The striped adobe lily is reported from various places throughout the county, including the Greenhorn Mountains, along Rancheria Road, and in the Tejon Hills. The three Tejon Hills records are in the northern portion of Covered Lands within Existing Conservation Easement Areas.

A habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-26* and *Appendix D* for description of methods used to develop the model). A total of 32,213 acres of suitable habitat for striped adobe lily was modeled for Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 29,476 acres (92%) of modeled suitable habitat for this species within Covered Lands. Covered Activities would result in the permanent loss of 2,737 acres (8%) of modeled suitable habitat for striped adobe lily within Covered Lands. The three documented occurrences on Covered Land are conserved in Existing Conservation Easement Areas.

Because this species occurs within the Covered Lands, the potential of this species to occur elsewhere within modeled suitable habitat on non-surveyed portions of Covered Lands is high (and it is possible that pre-construction surveys could identify individuals that could be permanently lost). However, because it is unlikely that all modeled suitable habitat would be saturated and because it is assumed that some modeled suitable habitat may not contain microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species. Furthermore, because 29,476 acres (90%) of the overall modeled suitable habitat for striped adobe lily would be conserved within a large, unfragmented open space system, and because of the number of remaining 20 extant populations of this species in Kern and Tulare counties and because the three known occurrences on Covered lands will be conserved in Existing Conservation Easement areas, the proposed impacts to this species as a result of Covered Activities would not substantially affect the population on site nor would it substantially affect the species in its broader range within California.

6.3.5 TEHACHAPI BUCKWHEAT

Tehachapi buckwheat (*Eriogonum callistum)* does not have Federal or state status, but has been recognized as a special-status species by CNDDB and added to the database (CDFG 2011d). Tehachapi buckwheat is also a CRPR 1B.1 species, and is considered seriously endangered in California (CDFG 2011d). Tehachapi buckwheat was first described in 2006 (Reveal 2006a). The Tehachapi buckwheat has a California Heritage Element Ranking of S1, indicating it is critically imperiled in the state because of extreme rarity (often five or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state (CDFG 2011d).

Based on the TMV Planning Area surveys, Tehachapi buckwheat is known only from the area immediately in and around the south central portion of the Covered Lands, near Poleline Ridge. In 2007, approximately 500 to 600 individuals were observed in this area (Dudek 2007a).

A habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-27* and *Appendix D* for description of methods used to develop the model). A total of 2,579 acres of suitable habitat for Tehachapi buckwheat was modeled for Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 2,562 acres (99%) of modeled suitable habitat for this species within Covered Lands. Covered Activities would result in the permanent loss of 16 acres (less than 1%) of modeled suitable habitat for Tehachapi buckwheat within Covered Lands.

Of the 500 to 600 Tehachapi buckwheat individuals documented in the Poleline Ridge area within Covered Lands, all individuals are within TMV Planning Area Open Space and will be avoided and conserved.

Because this species was found within the surveyed portion of Covered Lands, the potential of this species to occur elsewhere within modeled suitable habitat on non-surveyed portions of Covered Lands is high. However, because it is unlikely that all modeled suitable habitat would be saturated and because it is assumed that some modeled suitable habitat may not contain microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species. Furthermore, because 99% of the modeled suitable habitat for Tehachapi buckwheat would be conserved within a large, unfragmented open space system, and because the known population of 500 to 600 individuals would be avoided and conserved, the proposed impacts to this species as a result of Covered Activities would not substantially affect the species' population or range.

6.3.6 TEJON POPPY

Tejon poppy (*Eschscholzia lemmonii* ssp. *Kernensis)* has no Federal designation, but it is a CRPR 1B.1 species, considered seriously endangered in California (CDFG 2011d). The Tejon poppy has a California Heritage Element Ranking of S1, indicating it is critically imperiled in the state because of extreme rarity (often five or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state (CDFG 2011d).

Tejon poppy is endemic to central and western Kern County. The Jepson Online Interchange for California Floristics (Jepson Flora Project 2011) lists the southwest Tehachapi Mountain Area and northern Western Transverse Ranges as the geographic regions in which Tejon poppy occurs. The CNDDB includes 58 occurrences of this species (CDFG 2011), all of which are assumed to be extant. Tejon poppy is known to be extant in Elk Hills; and populations documented in older literature reports and collections from Comanche Point, Tejon Hills, Dry Bog Knoll in the Greenhorn Range foothills, near the mouth of Salt Creek, south of Maricopa near Devil's Gulch, and in the mesas east of Bakersfield are believed to be extant as habitats in these areas have not been altered significantly (Cypher 2006). No populations of Tejon poppy are known to have been extirpated, so the status of this species is assumed to be stable.

Tejon poppy was not observed during surveys in the Covered Lands and there are no CNDDB records for Covered Lands; however, there are numerous CNDDB records for Tejon poppy that lie west of the Covered Lands in Kern County. The nearest occurrence is approximately 1 mile southwest of the northern section of the Covered Lands and two other occurrences are west of the Covered Lands in the Tejon Hills (CDFG 2011a; TRC 2007a).

A habitat suitability model developed for the species for this TU MSHCP (see *Figure 5-28* and *Appendix D* for description of methods used to develop the model). A total of 12,672 acres of suitable habitat for Tejon poppy was modeled for Covered Lands.

Implementation of the conservation measures described in *Section 7* of this TU MSHCP would result in conservation of 12,533 acres (99%) of modeled suitable habitat for this species within Covered Lands. No individuals of Tejon poppy have been observed within the Covered Lands, but Covered Activities would result in the permanent loss of 108 acres (less than 1%) of modeled suitable habitat for Tejon poppy within Covered Lands.

Because this species was found adjacent to Covered Lands, the potential of this species to occur within modeled suitable habitat on non-surveyed portions of Covered Lands is high (and it is possible that pre-construction surveys could identify individuals that could be permanently lost). However, because it is unlikely that all modeled suitable habitat would be saturated and because it is assumed that some modeled suitable habitat may not contain microhabitat required by this species, not all modeled suitable habitat is expected to be occupied by this species. Furthermore, because 99% of the modeled suitable habitat for Tejon poppy would be conserved within a large, unfragmented open space system, and because of the number of remaining 58 extant populations of this species in Kern County, the proposed impacts to this species as a result of Covered Activities would not substantially affect the population on site nor would it substantially affect the species in its broader range within California.

6.4 SUMMARY OF EFFECTS

Table 6-1 summarizes impacts to Covered Species' modeled suitable habitat.

Table 6-1. Conservation Goals and Impacts for Covered Species' Modeled Suitable Habitat within Covered Lands

Species	Species Model	Suitable Habitat Lost[1] (acres / %)[2]	Suitable Habitat Conserved[4] (acres / %)[3,4]
Tehachapi slender salamander	Suitable habitat	143 (4%)	3,921 (96%)
Western spadefoot	Suitable habitat	30 (3%)	1,055 (90%)
Yellow-blotched salamander	Suitable habitat	1,179 (3%)	33,988 (97%)
American peregrine falcon	Foraging	2,741 (10%)	23,862 (89%)
	Breeding	1 (1%)	79 (99%)
Bald eagle	Foraging	5 (1%)	499 (96%)
	Wintering	834 (58%)	604 (42%)

[4] Suitable habitat conserved is species' suitable habitat within Established Open Space and TMV Planning Area Open Space (TU MSHCP Mitigation Lands) as well as the Existing Conservation Easement Areas, which have been permanently protected by recorded conservation easements.

Table 6-1 (Continued)

Species	Species Model	Suitable Habitat Lost[1] (acres / %)[2]	Suitable Habitat Conserved[4] (acres / %)[3,4]
Burrowing owl	Breeding/foraging	2,485 (10%)	22,406 (90%)
	Secondary breeding/foraging	552 (7%)	7,521 (93%)
Golden eagle	Foraging	30,040 (9%)	30,791 (91%)
	Breeding/foraging	2,045 (6%)	30,972 (94%)
	Primary breeding	2,613 (5%)	45,357 (95%)
Least Bell's vireo	Breeding/foraging	8 (1%)	582 (95%)
Little willow flycatcher	Foraging/Stopover	8 (1%)	954 (97%)
Purple martin	Breeding/foraging	4,762 (6%)	81,015 (94%)
Southwestern willow flycatcher	Breeding/foraging	8 (1%)	954 (97%)
Tricolored blackbird	Foraging	1,107 (6%)	17,373 (94%)
	Primary breeding	23 (8%)	198 (68%)
Western yellow-billed cuckoo	Breeding/foraging	8 (1%)	954 (97%)
White-tailed kite	Foraging	1,874 (21%)	7,021 (78%)
Yellow warbler	Breeding/foraging	8 (1%)	954 (97%)
	Secondary foraging	2,687 (5%)	49,008 (95%)
Valley elderberry longhorn beetle	Suitable habitat	0 (0%)	2,578 (99%)
Ringtail	Suitable habitat	8,287 (8%)	90,735 (91%)
Tehachapi pocket mouse	Suitable habitat	57 (3%)	1,874 (97%)
Coast horned lizard (*frontale* and *blainvillii* populations)	Primary habitat	3,959 (10%)	37,074 (90%)
	Secondary habitat	3 (4%)	51 (84%)
Two-striped garter snake	Suitable habitat	34 (9%)	254 (70%)
Fort Tejon woolly sunflower	Suitable habitat	5,368 (9%)	52,046 (91%)
Kusche's sandwort	Suitable habitat	2,097 (7%)	28,407 (93%)
Round-leaved filaree	Suitable habitat	4,997 (9%)	53,076 (91%)
Striped adobe lily	Suitable habitat	2,737 (9%)	29,476 (92%)
Tehachapi buckwheat	Suitable habitat	16 (1%)	2,562 (99%)
Tejon poppy	Suitable habitat	108 (1%)	12,533 (99%)

Notes:

[1] Suitable habitat lost is species' modeled suitable habitat within areas identified for Covered Activities.

[2] Percentage of modeled suitable habitat lost is calculated using species' total suitable habitat within Covered Lands.

[3] Percentage of modeled suitable habitat conserved is calculated using species' total suitable habitat within Covered Lands.

[4] The percentages of modeled habitat conserved and lost may not sum to 100% for three possible reasons: (1) rounding error; (2) 75% of riparian/wetlands are assumed avoided in development areas, but avoided areas are not included in the open space acreages; and (3) and 145 acres in the Lebec/Existing Headquarters Area are not developed but are not included.

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7. CONSERVATION PLAN FOR OTHER COVERED SPECIES

This section, together with *Section 5, Other Covered Species*, and *Section 6, Potential Biological Impacts/Take Assessment,* provides a complete analysis of the 26 Other Covered Species. This introduction summarizes the content of each section along with the linkages between them.

Section 5 focuses on the natural history of each of the 26 species, including status, distribution, and habitat characteristics, along with literature sources. Specific information is provided regarding the occurrence of the species within Covered Lands, along with the regulatory setting and listing status for each species. *Section 5* also summarizes the data and data sources used for the analysis of the 26 Other Covered Species, including data on vegetation communities, species occurrences, water features and drainages, topography, soils, and imagery. For this Tehachapi Uplands Multiple Species Habitat Conservation Plan (TU MSHCP), a model was developed for each of the 26 Other Covered Species to identify and map suitable habitat for the species within Covered Lands using relevant available data. *Section 5* summarizes the habitat suitability analysis process and references *Appendix D* to the TU MSHCP, where a detailed documentation of the model inputs for each species is provided. Maps depicting the model outputs for each species are presented in this section. *Appendix D1*, contained in *Appendix D* to the TU MSHCP, provides detailed descriptions of the biological survey methods for the Other Covered Species.

Section 6 provides the impact analysis and take assessment for each of the 20 wildlife Other Covered Species based on the project description and description of Covered Activities included in *Section 2, Plan Description and Activities Covered by Permit*. Since incidental take for the six covered plants is not provided for in the TU MSHCP, rather than an impact analysis and take assessment, *Section 6* describes the effects to plant Covered Species associated with implementation of the TU MSHCP Covered Activities. The impact assessments for the 26 Other Covered Species in this section are both quantitative and qualitative, and a description of the methods used for the impact assessment is included. For the 20 wildlife Other Covered Species, the assessments first include an analysis of the anticipated take of those species due to the Covered Activities described in *Section 2*. Then, analysis is provided of the impacts of the taking on the species as a whole. The take assessments for each species quantify the effects of Covered Activities with respect to reduction or loss of modeled suitable habitat as well as numbers of individuals, breeding territories, or foraging ranges anticipated to be lost, where feasible. Rationales for the estimates of individuals, breeding territories, or foraging ranges lost are provided for each of the 20 wildlife Other Covered Species. The impacts of the taking analyses include a summary of the status and distribution of the species within its range, a summary of the loss and conservation of the species expected to occur with implementation of the TU MSHCP, and a conclusion regarding the overall impacts of the taking associated with the TU MSHCP on the species as a whole. The assessment includes implementation of conservation and avoidance and minimization measures described in greater detail in this section.

This section (*Section 7*) presents the conservation plan for Other Covered Species proposed to be implemented as part of the TU MSHCP, including the avoidance, minimization, and mitigation measures to offset the effects analyzed in *Section 6*. The conservation plan or conservation strategy for each of the Covered Species consists of the species-specific goals and objectives presented in Section 7.1, the avoidance and minimization measures presented in Section 7.2, and the monitoring and management measures presented in Sections 7.3 and 7.4.

The primary feature of the TU MSHCP to avoid, minimize, and mitigate impacts to Other Covered Species is the conservation of modeled suitable habitat for the benefit of the Other Covered Species. Specifically, the TU MSHCP would conserve and manage 129,318 acres (91%) of Covered Lands as open space in perpetuity, including 116,523 acres within Established Open Space and Tejon Mountain Village (TMV) Planning Area Open Space and 12,795 acres of Existing Conservation Easement Areas. These areas include substantial acreages of modeled suitable habitat for the Other Covered Species as described in the species-specific goals and objectives presented in Section 7.1.

Avoidance and minimization measures in this section include surveys prior to grading for the Other Covered Species. At minimum, these surveys will be conducted in modeled suitable for the Covered Species (except valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)). However, because the habitat models were primarily intended to quantify impacts for the conservation analysis and to establish biological goals and objectives, they may not cover all areas of suitable habitat in the future. Therefore, the objectives allow for the project biologist to expand the surveys to areas that were not captured by the current habitat models, but are determined to be suitable for a Covered Species at the time construction is initiated (e.g., an expanding riparian area). Similarly, some modeled habitat areas may not be suitable for a Covered Species when construction is initiated. In these cases, after a careful field assessment, the project biologist may adjust the survey methods as appropriate. For these reasons, the term "suitable habitat" in reference to surveys prior to grading refers both to modeled suitable habitat and any additional suitable habitat the project biologist determines should be surveyed prior to grading activities.

Additionally, monitoring, management, adaptive management, and reporting measures incorporated in the TU MSHCP are described in this section as part of the overall conservation plan for Other Covered Species. This section also describes the ways in which take will be measured during implementation of the TU MSHCP in terms of habitat loss, the rationale for use of habitat loss as a measurement for take, and specific quantification of the take authorized by the TU MSHCP.

As discussed in Section 2.2.1, under the TU MSHCP, Plan-Wide Activities could result in up to 200 acres of permanent ground disturbance within open space areas. The 200 acres of permanent ground disturbance allocated to the Plan-Wide Activities would primarily be associated with construction of new roads and ancillary structures, if needed. The resulting impacts to modeled suitable habitat for the Other Covered Species are unknown because impact areas have not been identified. However, such impacts will be in accordance with this TU MSHCP and consistent with the measures in the Ranchwide Agreement to protect conservation values. The permanent loss of up 200 acres in open space areas represents 0.2% of the open space that would be conserved and managed in perpetuity.

7.1 BIOLOGICAL GOALS AND OBJECTIVES FOR OTHER COVERED SPECIES

This section addresses the 20 wildlife species and then the 6 plant species included as Other Covered Species (hereafter referred to as "Covered Species"). The Biological Goals and Objectives for the California condor (*Gymnogyps californianus*) are addressed separately in Section 4.3.

7.1.1 WILDLIFE SPECIES

7.1.1.1 AMPHIBIANS

There are three amphibians among the Covered Species: Tehachapi slender salamander (*Batrachoseps stebbinsi*), western spadefoot (*Spea hammondii*), and yellow-blotched salamander (*Ensatina eschscholtzii croceater*).

7.1.1.1.1 TEHACHAPI SLENDER SALAMANDER

Conservation of Modeled Suitable Habitat and Occurrences of Tehachapi Slender Salamander

Goal 1: Modeled suitable habitat for Tehachapi slender salamander will be conserved.

Objective 1.1: 3,921 acres (96%) of modeled suitable habitat for Tehachapi slender salamander will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: All currently known locations of Tehachapi slender salamander, as described in Section 5.2.1.1, will be conserved.

Objective 2.1: All currently known occurrences, as described in Section 5.2.1.1, will be conserved in Monroe Canyon and Beartrap Canyon.

Management of Threats to Tehachapi Slender Salamander

Goal 3: Habitat disturbances in modeled suitable habitat for Tehachapi slender salamander will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: Construction in modeled suitable habitat in riparian/wetlands areas will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts and not anticipated to exceed 3% of modeled suitable habitat).

Objective 3.2: Best management practices (BMPs) will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation) as required by applicable Clean Water Act and Porter-Cologne requirements, and air district requirements.

Objective 3.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 3.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 4: Impacts to Tehachapi slender salamander individuals will be avoided and/or minimized during construction activities for Covered Activities within and adjacent to suitable habitat areas for Tehachapi slender salamanders.

Objective 4.1: Surveys prior to grading will be conducted in suitable habitat. The project biologist will make reasonable efforts to capture and relocate any observed individuals to suitable habitat (e.g., on north-facing slopes containing talus) that is the closest distance to the disturbance area from where the individuals were removed. The project biologist conducting the capture and relocation of Tehachapi slender salamanders will have a Scientific Collecting Permit (SCP) and a Memorandum of Understanding (MOU) or letter permit from the California Department of Fish and Game (CDFG) to carry out these activities.

Objective 4.2: Prior to grading, activities in or immediately adjacent to suitable habitat will be monitored, including exclusion fencing, if appropriate, to prevent Tehachapi slender salamanders from entering construction zones.

Objective 4.3: To ensure that diseases are not conveyed between work sites by the project biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force (DAPTF 2009) will be followed at all times.

Goal 5: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for Tehachapi slender salamander.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant (*Linepithema humile*), and urban runoff in adjacent natural areas.

Objective 5.2: Lighting for commercial and residential Covered Activities adjacent or near open space will be directed away from modeled suitable habitat.

Objective 5.3: Within occupied or modeled suitable habitat for Tehachapi slender salamander within the TMV Planning Area, and for all hard surface roads within open space, culverts shall be placed under road connections and the roads shall be designed, in coordination with the project biologist, to prevent this species from entering the on-site roads from areas where this species occurs within or adjacent to the development footprint.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for Tehachapi slender salamander will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for Tehachapi slender salamander while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities in modeled suitable habitat for Tehachapi slender salamander will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 7.2: Public recreation, as managed by the Tejon Ranch Conservancy (Conservancy), shall be regulated through the Public Access Plan, which shall be reviewed and approved by the U.S. Fish and Wildlife Service (USFWS) per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.3: Tejon Ranchcorp (TRC) guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 8: The adverse effects of other permanent and non-permanent Covered Activities on individuals and/or modeled suitable habitat for Tehachapi slender salamander will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) or other ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.1.2 WESTERN SPADEFOOT

Conservation of Modeled Suitable Habitat for Western Spadefoot

Goal 1: Modeled suitable habitat for western spadefoot will be conserved.

Objective 1.1: 1,055 acres (90%) of modeled suitable habitat for western spadefoot will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to Western Spadefoot

Goal 2: Habitat disturbances within modeled suitable habitat for western spadefoot will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 2.1: Construction in modeled suitable habitat in riparian/wetlands areas will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts and not anticipated to exceed 3% of modeled suitable habitat).

Objective 2.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 2.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 2.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 3: Impacts to western spadefoot individuals will be avoided and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities within and adjacent to suitable habitat areas for western spadefoot.

Objective 3.1: Surveys prior to grading will be conducted in suitable habitat. The project biologist will make reasonable efforts to capture and relocate any observed individual to suitable habitat that is the closest distance to the disturbance area from where individuals were removed. If western spadefoots are detected (including egg masses, larvae), activities will be avoided until larvae have metamorphosed. A 300-foot setback will be established from occupied area if work must continue in or immediately adjacent to sites with egg masses and/or larvae. The project biologist may reduce the 300-foot setback at his or her discretion depending on the suitability of site conditions.

Objective 3.2: Prior to grading, activities in or immediately adjacent to suitable habitat will be monitored, including exclusion fencing, if appropriate, to prevent western spadefoots from entering construction zones.

Objective 3.3: To ensure that diseases are not conveyed between work sites by the project biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force (DAPTF 2009) will be followed at all times.

Goal 4: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for western spadefoot.

Objective 4.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 4.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled suitable habitat.

Goal 5: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for western spadefoot will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 5.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for western spadefoot while continuing to provide for commercial ranching and fire protection.

Objective 5.2: Pre-activity surveys will be conducted to determine presence/absence of western spadefoot prior to grazing operations and/or ranch activities that could adversely affect breeding habitat for western spadefoot, such as eliminating stockponds.

Goal 6: The effects of human recreation and pet activities in modeled suitable habitat for western spadefoot will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 6.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 6.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 7: The adverse effects of other permanent or non-permanent Covered Activities on individuals and/or modeled suitable habitat for western spadefoot will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 7.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 7.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of

appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.1.3 YELLOW-BLOTCHED SALAMANDER

Conservation of Modeled Suitable Habitat and Occurrences of Yellow-Blotched Salamander

Goal 1: Modeled suitable habitat for yellow-blotched salamander will be conserved.

Objective 1.1: 33,988 acres (97%) of modeled suitable habitat will be conserved for yellow-blotched salamander within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: All currently known locations of yellow-blotched salamander, as described in Section 5.2.1.3, will be conserved.

Objective 2.1: All currently known occurrences of yellow-blotched salamander, as described in Section 5.2.1.3, will be conserved generally north of Rising Canyon and south of Pastoria Canyon, east of Grapevine Peak in the vicinity of Silver, Monroe, and Squirrel canyons, and along tributaries to Beartrap Canyon.

Management of Threats to Yellow-Blotched Salamander

Goal 3: Habitat disturbances in modeled suitable habitat for yellow-blotched salamander will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: Construction in modeled suitable habitat on north-facing (0° to 90° and 0° to 270°) slopes and canopy cover greater than 40% will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts and not anticipated to exceed 3% of modeled suitable habitat).

Objective 3.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 3.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 3.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 4: Impacts to yellow-blotched salamander individuals will be avoided and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities within and adjacent to suitable habitat areas for yellow-blotched salamander.

Objective 4.1: Surveys prior to grading will be conducted in suitable habitat. The project biologist will make reasonable efforts to capture and relocate any observed individual to suitable habitat that is the closest distance to the disturbance area from where individuals were removed.

Objective 4.2: Prior to grading, activities in or immediately adjacent to suitable habitat will be monitored, including exclusion fencing, if appropriate, to prevent yellow-blotched salamanders from entering construction zones.

Objective 4.3: To ensure that diseases are not conveyed between work sites by the project biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force (DAPTF 2009) will be followed at all times.

Goal 5: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for yellow-blotched salamander.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 5.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled suitable habitat.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for yellow-blotched salamander will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for yellow-blotched salamander while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities in modeled suitable habitat for yellow-blotched salamander will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 7.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 8: The adverse effects of other permanent or non-permanent Covered Activities on individuals and/or modeled suitable habitat for yellow-blotched salamander will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.2 BIRDS

There are 12 birds among the Covered Species: American peregrine falcon (*Falco peregrinus anatum*), bald eagle (*Haliaeetus leucocephalus*), burrowing owl (*Athene cunicularia*), golden eagle (*Aquila chrysaetos*), least Bell's vireo (*Vireo bellii pusillus*), little willow flycatcher (*Empidonax traillii brewsteri*), purple martin (*Progne subis*), southwestern willow flycatcher (*Empidonax traillii extimus*), tricolored blackbird (*Agelaius tricolor*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), white-tailed kite (*Elanus leucurus*), and yellow warbler (*Dendroica petechia brewsteri*).

7.1.1.2.1 AMERICAN PEREGRINE FALCON

Conservation of Modeled Suitable Habitat for American Peregrine Falcon

Goal 1: Modeled foraging habitat for American peregrine falcon will be conserved.

Objective 1.1: 23,862 acres (89%) of modeled foraging habitat for American peregrine falcon will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: Modeled breeding habitat for American peregrine falcon will be conserved.

Objective 2.1: 79 acres (99%) of modeled breeding habitat for American peregrine falcon will be permanently conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to American Peregrine Falcon

Goal 3: Habitat disturbances in riparian/wetland modeled foraging and wintering habitat for American peregrine falcon (including riparian scrub, riparian/wetland, and wash) will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities; all lethal take will be avoided.

Objective 3.1: Construction in riparian/wetland modeled foraging and wintering habitat will be avoided in open space areas to the extent practicable (generally anticipated to be limited to road crossings and culverts).

Objective 3.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Goal 4: Impacts to breeding American peregrine falcon individuals will be avoided, as will direct take of occupied nests, during construction activities for commercial and residential Covered Activities. All lethal take of American peregrine falcons will be avoided.

Objective 4.1: Surveys prior to grading in suitable breeding habitat will be conducted during the breeding season (March through August) to determine if nesting American peregrine falcons are present.

Objective 4.2: If active American peregrine falcon nests are detected during surveys prior to grading, a 0.25-mile protection zone will be established around each active nest and prohibit grading and land-altering activities within the 0.25-mile protection zone as long as the nest is active. Active nests and 0.25-mile protection zones will be mapped on appropriate planning maps. The 0.25-mile protection zone may be reduced at the discretion of the project biologist depending on site viewshed characteristics.

Objective 4.3: The project biologist will monitor construction activities in suitable habitat to assure avoidance of any harm to individuals and will have the authority to direct the cessation of field activities likely to cause any such harm.

Goal 5: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in suitable riparian/wetland modeled foraging and wintering habitat for American peregrine falcon; all lethal take will be avoided.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species and urban runoff in adjacent natural areas.

Goal 6: Long-term (operational) impacts to breeding American peregrine falcon individuals from recreational and other activities, excluding grazing, fencing, and ancillary ranch structures addressed in Goal 7, will be avoided; all lethal take will be avoided.

Objective 6.1: Pre-activity surveys will be conducted during the breeding season (March through August) in modeled breeding habitat to determine if nesting American peregrine falcons are present.

Objective 6.2: If active American peregrine falcon nests are detected during pre-activity surveys, a 1,000-foot protection zone will be established around each active nest and prohibit recreational and other activities within the 1,000-foot zone until all the young have fledged and are no longer dependent upon the nest for survival to avoid causing nest abandonment by adults. The project biologist may reduce the 1,000-foot protection zone at his or her discretion depending on the suitability of site conditions. Active nests and 1,000-foot protection zones will be mapped on appropriate planning maps.

Goal 7: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in riparian/wetland modeled foraging and wintering habitat (including temporary roost sites) for American peregrine falcon will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 7.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for American peregrine falcon while continuing to provide for commercial ranching and fire protection.

Goal 8: The effects of human recreation and pet activities in modeled foraging and wintering habitat (including temporary roost sites) for American peregrine falcon will be avoided and effects that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 8.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 8.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 8.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 9: The effects of other permanent or non-permanent Covered Activities on individuals and/or modeled suitable habitat for American peregrine falcon will be avoided (including avoiding direct take of occupied nests) and effects that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 9.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 9.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 9.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.2.2 BALD EAGLE

Conservation of Modeled Suitable Habitat for Bald Eagle

Goal 1: Modeled wintering habitat for bald eagle will be conserved.

Objective 1.1: 604 acres (42%) of modeled wintering habitat for bald eagle will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: Modeled foraging habitat for bald eagle will be conserved.

Objective 2.1: 499 acres (96%) of modeled foraging habitat for bald eagle will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 3: Preferred diurnal perches and high-quality roost trees for bald eagle will be conserved to preserve productivity for bald eagles wintering in the area.

Objective 3.1: Subject to Kern County Fire Department approval, removal of preferred diurnal perches and high-quality roost trees from fuel modification zones within 1 mile of Castac Lake, as identified by the project biologist, will be prohibited.

Objective 3.2: Prior to grading, the project biologist will conduct focused surveys for wintering (October through March) bald eagles within the proposed project phase and, if present, their preferred diurnal perches and roosting areas will be mapped and avoided.

Management standards will be applied to preferred diurnal perches and high-quality roost trees (those trees with greater than 12-inch diameter at breast height) for bald eagle that are within 100 feet of the shoreline of Castac Lake in designated open space. The following measures present a menu of options for bald eagle management:

- Diurnal perch areas will be selectively thinned to stimulate the growth of existing trees and enhance perching habitat by creating openness in these areas.
- New large tree species will be planted within 100 feet of the shoreline of Castac Lake in areas preserved for bald eagle at a 1:1 ratio to replace large trees impacted within 100 feet of the shoreline of Castac Lake.

- A small percentage of trees will be girdled within 100 feet of the shoreline of Castac Lake in areas preserved for bald eagle in order to create snags for perching; the percentage of trees girdled will be determined by the project biologist. Girdling will kill the trees by destroying the cambial layer, thus creating roosts and snags.

Objective 3.3: Snags and large trees will be avoided within 100 feet of the shoreline of Castac Lake to the maximum extent practicable.

Objective 3.4: Identified preferred roosting areas that are well-protected from wind (e.g., in a canyon or blocked by trees) will be preserved, including an adequate setback from preserved roosting areas. The setback will be determined by the project biologist using data collected during the focused surveys for wintering bald eagles, which will be conducted prior to the approval of the grading plan for each phase of development within 1 mile of the edge of Castac Lake. Between October 15 and March 15, uses within the roost areas and the setback will be limited to those approved by the project biologist but will exclude activities such as hunting (starting November 1 through March) and other recreational uses.

Management of Threats to Bald Eagle

Goal 4: Habitat disturbances in suitable foraging and wintering habitat for bald eagle that could result in direct disturbance or injury to individuals will be avoided during construction activities for commercial and residential Covered Activities. All lethal take of bald eagles will be avoided.

Objective 4.1: Construction in wetland habitat associated with Castac Lake and woodland habitat within 1 mile of the Lake will be avoided October through March.

Objective 4.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 4.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 4.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Objective 4.5: The project biologist will conduct surveys prior to grading, will monitor construction activities in suitable foraging and wintering habitat to assure avoidance of any harm to individuals, and will have the authority to direct the cessation of field activities likely to cause any such harm.

Goal 5: Long-term (operational) impacts will be avoided, as will direct disturbance or injury to individuals, and effects that cannot be avoided will be minimized to the extent practicable in modeled foraging and wintering habitat for bald eagle; all lethal take will be avoided.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled foraging and wintering habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 5.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled foraging and wintering habitat.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in suitable riparian woodland, riparian/wetland, and wetland modeled foraging and wintering habitat for bald eagle, and direct disturbance or injury to individuals, will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for bald eagle while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities in modeled foraging and wintering habitat for bald eagle, and direct disturbance or injury to individuals, will be avoided, and indirect effects that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 7.2: Intentional feeding of bald eagles will be prohibited on the Covered Lands, and language will be included in the covenants, conditions, and restrictions (CC&Rs) that prohibits the feeding of this species and other wildlife species on the Covered Lands. The project biologist will install signage adjacent to Castac Lake indicating that feeding bald eagles is prohibited. Such signage will indicate that prohibitions will be enforceable for all residents and guests.

Objective 7.3: Maintain a minimum 300-foot setback from preferred diurnal perches and high-quality roost trees in the TMV Planning Area between October and March in order to limit human disturbance. The project biologist may reduce the 300-foot setback at his or her discretion depending on the suitability of site conditions.

Objective 7.4: Hunting will be limited within the TMV Planning Area to guided hunts under the direction of a designated project conservation manager for the purpose of population management. All participants in any such on-site population management efforts will be educated in the identification and behavior of the bald eagle and supervised by the designated project conservation manager to avoid any accidental encounter with bald eagle. Pursuant to the perpetual lead ammunition ban, only non-lead ammunition will be used at all times within the Covered Lands during hunts of any kind.

Objective 7.5: Interpretive and educational signage will be installed at Castac Lake, informing the public about bald eagles, their habitat requirements, and their sensitivity to human disturbance during the wintering season for the species (late October through March).

Objective 7.6: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.7: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 8: The effects of other permanent or non-permanent Covered Activities on individuals and/or modeled foraging and wintering habitat for bald eagle, including direct disturbance or injury to individuals, will be avoided, and indirect effects that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas; all lethal take will be avoided.

7.1.1.2.3 BURROWING OWL

Conservation of Modeled Suitable Habitat for Burrowing Owl

Goal 1: Modeled primary breeding/foraging habitat for burrowing owl will be conserved.

Objective 1.1: 22,406 acres (90%) of modeled primary breeding/foraging habitat for burrowing owl will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: Modeled secondary breeding/foraging habitat for burrowing owl will be conserved.

Objective 2.1: 7,521 acres (93%) of modeled secondary breeding/foraging habitat for burrowing owl will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to Burrowing Owl

Goal 3: Inadvertent habitat disturbances to modeled primary breeding/foraging habitat for burrowing owl will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: Avoidance/minimization measures will be implemented adjacent to modeled primary breeding/foraging habitat for burrowing owl, including fencing/flagging of disturbance/grading perimeters, contractor/construction personnel meetings prior to grading, and discretionary biological monitoring.

Goal 4: Direct impacts to breeding burrowing owls will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities, as well as fuel modification activities related to implementing any ground-disturbing fuel modification activities under the Fire Prevention Plan (FPP).

Objective 4.1: Surveys prior to grading for burrowing owls will be conducted 30 days prior to scheduled construction activity in suitable habitat to determine if burrowing owls are present on site and, if present, their breeding status (breeding season is March through August).

Objective 4.2: If non-nesting burrowing owls are observed on site, construction work will proceed after owls are evacuated from site using a CDFG-approved burrow closure procedure and after alternative burrow sites have been provided in accordance with CDFG's *Staff Report on Burrowing Owl Mitigation* (CDFG 1995). Results of surveys and relocation efforts will be submitted to CDFG.

Objective 4.3: If nesting burrowing owls are observed on site, construction work within 300 feet of active nest burrows will be delayed until fledglings have left or are independent of the nest, as determined by the project biologist. The project biologist may reduce the 300-foot setback at his or her discretion depending on the suitability of site conditions. Nests that become active within designated construction zones after initiation of construction will be avoided (i.e., active nests would not be directly disturbed), but no setback will be provided. Results of survey and avoidance of nesting burrowing owl will be submitted to CDFG.

Goal 5: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable to modeled primary breeding/foraging habitat for burrowing owl.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled primary breeding/foraging habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 5.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled primary breeding/foraging habitat.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled primary and secondary breeding/foraging habitat for burrowing owl will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for burrowing owl while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities in modeled primary breeding/foraging habitat for burrowing owl (including avoiding direct take of occupied nests) will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 7.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 8: Avoid and minimize the effects of other permanent or non-permanent Covered Activities on individuals (including avoiding direct take of occupied nests) and/or modeled primary and secondary breeding/foraging habitat for burrowing owl.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, nest avoidance measures, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.2.4 GOLDEN EAGLE

Conservation of Modeled Suitable Habitat for Golden Eagle

Goal 1: Modeled primary breeding habitat for golden eagle will be conserved.

Objective 1.1: 45,357 acres (95%) of modeled primary breeding habitat for golden eagle will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: Modeled breeding/foraging habitat for golden eagle will be conserved.

Objective 2.1: 30,972 acres (94%) of modeled breeding/foraging habitat for golden eagle will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 3: Modeled foraging habitat for golden eagle will be conserved that will adequately preserve eagle territory integrity of the known breeding population within the TMV Planning Area as well as additional territories that may occur within Covered Lands.

Objective 3.1: 30,791 acres (91%) of modeled foraging habitat for golden eagle will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Conservation of Active Nest Sites of Golden Eagle

Goal 4: All active golden eagle nest sites will be conserved.

Objective 4.1: For commercial and residential Covered Activities, active primary golden eagle nest sites and active alternate nest sites observed prior to approval of the grading plan for each phase of development in the Covered Lands will be conserved, as described for Goal 6 and Goal 9 below.

Management of Threats to Golden Eagle

Goal 5: To preserve eagle territory integrity, inadvertent habitat disturbances to modeled primary breeding, breeding/foraging, and foraging habitat for golden eagle, and direct disturbance or injury to individuals, will be avoided, and indirect habitat effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities. All lethal take of golden eagles will be avoided.

Objective 5.1: Avoidance/minimization measures will be implemented adjacent to modeled primary breeding, breeding/foraging, and foraging habitat for golden eagle, including fencing/flagging of disturbance/grading perimeters, dust control, contractor/construction personnel meetings prior to grading, and biological monitoring.

Goal 6: Direct impacts to active primary golden eagle nests and active alternate nests and direct disturbance or injury to individuals during construction activities will be avoided, and indirect habitat effects that cannot be avoided will be minimized to the extent practicable for Covered Activities; all lethal take will be avoided.

Objective 6.1: Surveys for active primary golden eagle nests and active alternate nests will be conducted during the breeding season (January through August) prior to approval of the backbone infrastructure grading plan (so as to assist in the constraints planning effort for potential development sites) for each phase of development in modeled primary breeding and breeding/foraging habitat.

Objective 6.2: If active golden eagle nest sites (primary and/or alternate) are observed on site during the survey, a nest-specific analysis will be prepared to identify the primary nest and establish its viewshed (the "Viewshed"). Because golden eagles typically build primary and alternate nests in relative close proximity to each other, often within the same tree groves, active alternate nest sites will generally be protected by the same viewshed analysis as applied to the primary nest site. A complete viewshed analysis will be conducted for the primary nests determined to be in active use, and the following standards to avoid/minimize disturbance to active nests will apply:

- No development, new trails, or recreational activities will occur within 0.25 mile of an active golden eagle nest, within or outside of the Viewshed.
- No development will occur within the Viewshed that is also within 0.5 mile of an active nest.
- Between 0.25 and 1.0 mile from the active primary golden eagle nest and outside of the Viewshed, and between 0.5 and 1.0 mile of any active golden eagle nest and within the nest Viewshed, development will be restricted to low-density development (e.g., mountain residential) and homes must be sited to minimize visibility to golden eagle nests.
- Between 0.5 and 1.0 mile from an active golden eagle nest, siting and design criteria will be established to avoid/minimize loss of modeled foraging habitat, including preserving larger, contiguous blocks of modeled foraging habitat through clustering development (i.e., higher density development).

Objective 6.3 The project biologist will monitor construction activities in suitable breeding and breeding/foraging habitat to assure avoidance of any harm to individuals and will have the authority to direct the cessation of field activities likely to cause any such harm.

Goal 7: Long-term (operational) impacts will be avoided, as will direct disturbance or injury to individuals and nests, and indirect effects that cannot be avoided will be minimized to the extent practicable to modeled primary breeding and breeding/foraging habitat for golden eagle; all lethal take of golden eagles will be avoided.

Objective 7.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled primary breeding and breeding/foraging habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as urban runoff in adjacent natural areas.

Objective 7.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled primary breeding and breeding/foraging habitat.

Goal 8: The effects of cattle-related impacts, including fencing and ancillary ranch structures, on modeled primary breeding, breeding/foraging, and foraging habitat for golden eagle, as well as direct disturbance or injury to individuals, will be avoided, and indirect effects to modeled habitat that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 8.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for golden eagle while continuing to provide for commercial ranching and fire protection.

Goal 9: The effects of human recreation and pet activities on active primary golden eagle nests and active alternate nests, and direct disturbance or injury to individuals, will be avoided, and indirect effects that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 9.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 9.2: Trail use will be restricted between 0.25 and 0.5 mile from an active primary or active alternate golden eagle nest during the nesting season (February 1 through June 1). Trail use may be allowed during the nesting season, if the project biologist or

USFWS-approved Tejon Staff Biologist has determined that the nest has become inactive and/or trail use would not affect nesting golden eagle.

Objective 9.3: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 9.4: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 10: The effects of other permanent or non-permanent Covered Activities on individuals and/or modeled primary breeding, breeding/foraging, and foraging habitat for golden eagle, including direct disturbance or injury to individuals and active primary or active alternate nests, will be avoided, and effects that cannot be avoided will be minimized to the extent practicable; all lethal take of golden eagles will be avoided.

Objective 10.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 10.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 10.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.2.5 LEAST BELL'S VIREO

Conservation of Modeled Suitable Habitat for Least Bell's Vireo

Goal 1: Modeled breeding/foraging habitat for least Bell's vireo will be conserved.

Objective 1.1: 582 acres (95%) of modeled breeding/foraging habitat for least Bell's vireo will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to Least Bell's vireo

Goal 2: Habitat disturbances in modeled breeding/foraging habitat for least Bell's vireo will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 2.1: Construction in modeled breeding/foraging habitat in riparian/wetlands habitat areas will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts and not anticipated to exceed 5% of modeled breeding/foraging habitat).

Objective 2.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 2.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 2.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 3: Impacts to breeding least Bell's vireos during construction activities for commercial and residential Covered Activities will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 3.1: Surveys prior to grading for breeding least Bell's vireo will be conducted for construction activities in or immediately adjacent to suitable breeding/foraging habitat scheduled for the breeding season (April through August).

Objective 3.2: If breeding least Bell's vireos are observed on site, construction activities will be avoided during the breeding season, or, if construction must take place during the breeding season, a 500-foot setback will be provided or noise-attenuating measure(s) will be implemented, until young have fledged and are no longer dependent on the nest or nest territory. The project biologist may reduce the 500-foot setback at his or her discretion depending on the suitability of site conditions; however, the setback may not be less than 300 feet.

Goal 4: Long-term (operational) impacts will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable to modeled breeding/foraging habitat for least Bell's vireo.

Objective 4.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled breeding/foraging habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 4.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled breeding/foraging habitat.

Goal 5: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled breeding/foraging habitat for least Bell's vireo will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 5.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for least Bell's vireo while continuing to provide for commercial ranching and fire protection.

Goal 6: The effects of human recreation and pet activities on modeled breeding/foraging habitat for least Bell's vireo and breeding individuals will be avoided (including avoiding direct take of occupied nests), and effects that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 6.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 6.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 7: The effects of other permanent or non-permanent Covered Activities on individuals and/or modeled breeding/foraging habitat for least Bell's vireo will be avoided (including avoiding direct take of occupied nests), and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 7.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 7.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.2.6 LITTLE WILLOW FLYCATCHER

Conservation of Modeled Suitable Habitat for Little Willow Flycatcher

Goal 1: Modeled foraging/winter stopover habitat for little willow flycatcher will be conserved.

Objective 1.1: 954 acres (97%) of modeled foraging/winter stopover habitat for little willow flycatcher will be conserved within Established Open

Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to Little Willow Flycatcher

Goal 2: Habitat disturbances in modeled foraging/winter stopover habitat for little willow flycatcher will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 2.1: Construction in modeled foraging/winter stopover habitat in riparian/wetlands habitat areas will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts and not anticipated to exceed 3% of modeled foraging/winter stopover habitat).

Objective 2.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 2.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 2.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 3: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable to modeled foraging/winter stopover habitat for little willow flycatcher.

Objective 3.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled foraging/winter stopover habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 3.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled foraging/winter stopover habitat.

Goal 4: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled foraging/winter stopover habitat for little willow flycatcher will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 4.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for little willow flycatcher while continuing to provide for commercial ranching and fire protection.

Goal 5: The effects of human recreation and pet activities on modeled foraging/winter stopover habitat for little willow flycatcher will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 5.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 5.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 5.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 6: The effects of other permanent or non-permanent Covered Activities on individuals and/or modeled foraging/winter stopover habitat for little willow flycatcher will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 6.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 6.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.2.7 PURPLE MARTIN

Conservation of Modeled Suitable Habitat for Purple Martin

Goal 1: Modeled breeding/foraging habitat for purple martin will be conserved.

Objective 1.1: 81,015 acres (94%) of modeled breeding/foraging habitat for purple martin will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to Purple Martin

Goal 2: Habitat disturbances in modeled breeding/foraging habitat for purple martin will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 2.1: Construction in riparian/wetland modeled breeding/foraging habitat in riparian/wetlands habitat areas will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts).

Objective 2.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 2.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 2.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 3: Impacts to breeding purple martin will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: Surveys for breeding purple martin will be conducted during the breeding season (April through August) for construction activities within suitable breeding/foraging habitat scheduled for the breeding season.

Objective 3.2: If breeding purple martins are observed in the project disturbance zone, construction activities will be avoided during the breeding season (April through August).

Goal 4: Long-term (operational) impacts will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable to modeled breeding/foraging habitat for purple martin.

Objective 4.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled breeding/foraging habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 4.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled breeding/foraging habitat.

Goal 5: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled breeding/foraging habitat for purple martin will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 5.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for purple martin while continuing to provide for commercial ranching and fire protection.

Goal 6: The effects of human recreation and pet activities on modeled breeding/foraging habitat for purple martin will be avoided (including avoiding direct take of occupied nests), and effects that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 6.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 6.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 7: The effects of other permanent or non-permanent Covered Activities on individuals and/or modeled breeding/foraging habitat for purple martin will be avoided (including avoiding direct take of occupied nests), and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 7.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 7.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

Goal 8: Adverse effects of the European starling (*Sturnus vulgaris*) on modeled breeding/foraging habitat for the purple martin will be minimized.

Objective 8.1: European starling monitoring, removal, and management methods will be implemented if determined necessary by the project biologist. Prior to implementation, the project biologist will develop a management plan that will specify, at a minimum, the methods for capturing European starlings and the process for euthanizing captured European starlings (e.g., humane euthanasia according to American Veterinary Medical Association (2001) guidelines). The plan will be implemented based upon the abundance of the species within 500 feet of modeled breeding/foraging habitat for purple martin during the breeding season or the presence of large winter flock sizes.

7.1.1.2.8 SOUTHWESTERN WILLOW FLYCATCHER

Conservation of Modeled Suitable Habitat for Southwestern Willow Flycatcher

Goal 1: Modeled breeding/foraging habitat for southwestern willow flycatcher will be conserved.

Objective 1.1: 954 acres (97%) of modeled breeding/foraging habitat for southwestern willow flycatcher will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to Southwestern Willow Flycatcher

Goal 2: Habitat disturbances in modeled breeding/foraging habitat for southwestern willow flycatcher will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 2.1: Construction in modeled breeding/foraging habitat in riparian/wetlands habitat areas will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts and not anticipated to exceed 3% of modeled breeding/foraging habitat).

Objective 2.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 2.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 2.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 3: Impacts to breeding southwestern willow flycatchers will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: Surveys for breeding southwestern willow flycatcher will be conducted for construction activities in or immediately adjacent to suitable breeding/foraging habitat scheduled for the breeding season.

Objective 3.2: If breeding southwestern willow flycatchers are observed on site, construction activities will be avoided during the breeding season, or, if construction must take place during the breeding season, a 500-foot setback will be provided or noise-attenuating measure(s) will be implemented, until young have fledged and are no longer dependent on the nest or nest territory. The project biologist may reduce the 500-foot setback at his or her discretion depending on the suitability of site conditions; however, the setback may not be less than 300 feet.

Goal 4: Long-term (operational) impacts will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable to modeled breeding/foraging habitat for southwestern willow flycatcher.

Objective 4.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled breeding/foraging habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 4.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled breeding/foraging habitat.

Goal 5: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled breeding/foraging habitat for southwestern willow flycatcher will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 5.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for southwestern willow flycatcher while continuing to provide for commercial ranching and fire protection.

Goal 6: The effects of human recreation and pet activities on modeled breeding/foraging habitat for southwestern willow flycatcher and breeding individuals will be avoided (including avoiding direct take of occupied nests), and effects that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 6.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 6.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 7: The effects of other permanent or non-permanent Covered Activities on individuals and/or modeled breeding/foraging habitat for southwestern willow flycatcher will be avoided (including avoiding direct take of occupied nests), and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 7.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 7.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.2.9 TRICOLORED BLACKBIRD

Conservation of Modeled Suitable Habitat for Tricolored Blackbird

Goal 1: Modeled foraging habitat for tricolored blackbird will be conserved.

Objective 1.1: 17,373 acres (94%) of modeled foraging habitat for tricolored blackbird will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: Modeled primary breeding habitat for tricolored blackbird will be conserved.

Objective 2.1: 198 acres (68%) of modeled primary breeding habitat for tricolored blackbird will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to Tricolored Blackbird

Goal 3: Habitat disturbances in modeled primary breeding and foraging habitat within riparian and wetland areas for tricolored blackbird will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: Construction in modeled primary breeding and foraging habitat within riparian and wetland areas will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts).

Objective 3.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 3.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 3.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 4: Impacts to breeding tricolored blackbirds will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 4.1: Surveys for breeding tricolored blackbird will be conducted for construction activities in or immediately adjacent to suitable breeding habitat resulting in permanent ground disturbance and scheduled for the breeding season.

Objective 4.2: If breeding tricolored blackbirds are observed on site, construction activities will be avoided during the breeding season, or, if construction must take place during the breeding season, a 500-foot setback will be provided or noise-attenuating measure(s) will be implemented, until nesting has been completed in the colony. The project biologist may reduce the 500-foot setback at his or her discretion depending on the suitability of site conditions; however, the setback may not be less than 300 feet.

Goal 5: Long-term (operational) impacts will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable to modeled primary breeding and foraging habitat for tricolored blackbird.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled primary breeding and foraging habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 5.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled primary breeding and foraging habitat.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled foraging and primary breeding habitat for tricolored blackbird will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain existing modeled habitat for tricolored blackbird while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities on modeled primary breeding and foraging habitat for tricolored blackbird and breeding individuals will be avoided (including avoiding direct take of occupied nests), and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 7.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 8: The effects of other permanent or non-permanent Covered Activities on individuals and/or modeled primary breeding and foraging habitat for tricolored blackbird will be avoided (including avoiding direct take of occupied nests), and effects that cannot be avoided will be minimized to the extent practicable.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

Goal 9: The adverse effects of pesticides on modeled primary breeding and foraging habitat for tricolored blackbird will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 9.1: An Integrated Pest Management Plan will be developed and implemented in conjunction with development, ranchwide operations, and management of open space. Measures should address avoiding exposure of tricolored blackbird to pesticides and can include, for example, the storage of pesticides in secure containers and facilities and the use of pesticides that target specific pests in place of broad-spectrum pesticides.

7.1.1.2.10 WESTERN YELLOW-BILLED CUCKOO

Conservation of Modeled Suitable Habitat for Western Yellow-Billed Cuckoo

Goal 1: Modeled breeding/foraging habitat for western yellow-billed cuckoo will be conserved.

Objective 1.1: 954 acres (97%) of modeled breeding/foraging habitat for western yellow-billed cuckoo will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to Western Yellow-Billed Cuckoo

Goal 2: Habitat disturbances in modeled breeding/foraging habitat for western yellow-billed cuckoo will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 2.1: Construction in modeled breeding/foraging habitat in riparian/wetlands habitat areas will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts and not anticipated to exceed 3% of modeled breeding/foraging habitat).

Objective 2.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 2.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 2.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 3: Impacts to breeding western yellow-billed cuckoos will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: Surveys prior to grading for breeding western yellow-billed cuckoo will be conducted for construction activities in or immediately adjacent to suitable breeding/foraging habitat scheduled for the breeding season.

Objective 3.2: If breeding western yellow-billed cuckoos are observed on site, construction activities will be avoided during the breeding season, or, if construction must take place during the breeding season, a 500-foot setback will be provided or noise-attenuating measure(s) will be implemented, until young have fledged and are no longer dependent on the nest or nest territory. The project biologist may reduce the 500-foot setback at his or her discretion depending on the suitability of site conditions; however, the setback may not be less than 300 feet.

Goal 4: Long-term (operational) impacts will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable to modeled breeding/foraging habitat for western yellow-billed cuckoo.

Objective 4.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled breeding/foraging habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 4.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled breeding/foraging habitat.

Goal 5: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled breeding/foraging habitat for western yellow-billed cuckoo will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 5.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for western yellow-billed cuckoo while continuing to provide for commercial ranching and fire protection.

Goal 6: The effects of human recreation and pet activities on modeled breeding/foraging habitat for western yellow-billed cuckoo and breeding individuals will be avoided (including avoiding direct take of occupied nests), and effects that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 6.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 6.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 7: The effects of other permanent or non-permanent Covered Activities on individuals and/or modeled breeding/foraging habitat for western yellow-billed cuckoo will be avoided (including avoiding direct take of occupied nests), and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 7.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 7.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.2.11 WHITE-TAILED KITE

Conservation of Modeled Suitable Habitat for White-Tailed Kite

Goal 1: Modeled foraging habitat for white-tailed kite will be conserved.

Objective 1.1: 7,021 acres (78%) of modeled foraging habitat for white-tailed kite will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Conservation of Active Nest Sites of White-Tailed Kite

Goal 2: All active white-tailed kite nest sites will be conserved.

Objective 2.1: All active nest sites detected during surveys prior to grading will be conserved, as described for Goal 4 below.

Management of Threats to White-Tailed kite

Goal 3: Inadvertent habitat disturbances to modeled foraging habitat for white-tailed kite will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities; all lethal take of white-tailed kites will be avoided.

Objective 3.1: Although white-tailed kites not expected to breed on site, construction in riparian woodland potential breeding habitat in riparian/wetlands habitat areas will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts and not anticipated to exceed 3% of riparian/wetlands habitat).

Objective 3.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 3.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 3.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 4: Impacts to active white-tailed kite nests will be avoided during construction activities for commercial and residential Covered Activities; all lethal take will be avoided.

Objective 4.1: Preconstruction surveys will be conducted for active white-tailed kite nests during the breeding season (March through September) prior to development in or immediately adjacent to the modeled foraging habitat.

Objective 4.2: If active white-tailed kite nest sites are detected during surveys prior to grading, a protection zone of 500 feet around each nest will be established and no grading or land-altering activities will be allowed within this zone to protect the viability of the nest territory as long as the nest is active. The project biologist in coordination with USFWS may reduce the 500-foot setback at his or her discretion depending on the suitability of site conditions; however, the setback may not be less than 300 feet.

Objective 4.3: The project biologist will monitor construction activities in suitable foraging habitat to assure avoidance of any harm to individuals and will have the authority to direct the cessation of field activities likely to cause any such harm.

Goal 5: Long-term (operational) impacts will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable to modeled foraging habitat for white-tailed kite; all lethal take will be avoided.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled foraging habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 5.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled foraging habitat.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled foraging habitat for white-tailed kite will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for white-tailed kite while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities on active white-tailed kite nests will be avoided (including avoiding direct take of occupied nests) and effects that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 7.2: Covered recreation activities within 500 feet of an active nest during the white-tailed kite breeding season (March through September) will be prohibited until all young have fledged and are no longer dependent on the nest for survival. The active nest will be mapped on appropriate maps. The project biologist in coordination with USFWS may reduce the 500-foot setback at his or her discretion depending on the suitability of site conditions; however, the setback may not be less than 300 feet.

Objective 7.3: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.4: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 8: The effects of other permanent or non-permanent Covered Activities on individuals and/or modeled foraging habitat for white-tailed kite will be avoided (including avoiding direct take of occupied nests) and effects that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.2.12 YELLOW WARBLER

Conservation of Modeled Suitable Habitat for Yellow Warbler

Goal 1: Modeled breeding/foraging habitat for yellow warbler will be conserved.

Objective 1.1: 954 acres (97%) of modeled breeding/foraging habitat for yellow warbler will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: Modeled secondary foraging habitat for yellow warbler will be conserved.

Objective 2.1: 49,008 acres (95%) of modeled secondary foraging habitat for yellow warbler will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to Yellow Warbler

Goal 3: Habitat disturbances in modeled breeding/foraging habitat for yellow warbler will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: Construction in modeled breeding/foraging habitat in riparian/wetlands habitat areas will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts and not anticipated to exceed 5% of modeled breeding/foraging habitat).

Objective 3.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 3.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 3.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 4: Impacts to breeding yellow warblers will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 4.1: Surveys for breeding yellow warbler will be conducted during the breeding season (April through August) for construction activities in or immediately adjacent to suitable breeding/foraging habitat scheduled for the breeding season.

Objective 4.2: If breeding yellow warblers are observed in the project disturbance zone, grading construction activities will be avoided where detected and appropriate setbacks will be established during the breeding season (April through August).

Goal 5: Long-term (operational) impacts will be avoided, as will direct take of occupied nests, and effects that cannot be avoided will be minimized to the extent practicable to modeled breeding/foraging habitat for yellow warbler.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled breeding/foraging habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 5.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled breeding/foraging habitat.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled breeding/foraging habitat for yellow warbler will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for yellow warbler while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities on modeled breeding/foraging habitat for yellow warbler and breeding individuals will be avoided (including avoiding direct take of occupied nests), and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 7.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 8: The effects of other permanent or non-permanent Covered Activities on individuals and/or modeled breeding/foraging habitat for yellow warbler will be avoided (including avoiding direct take of occupied nests), and effects that cannot be avoided will be minimized to the extent practicable.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.3 INSECTS

7.1.1.3.1 VALLEY ELDERBERRY LONGHORN BEETLE

There is one insect among the Covered Species: valley elderberry longhorn beetle.

Conservation of Modeled Suitable Habitat for Valley Elderberry Longhorn Beetle

Goal 1: Modeled suitable habitat for valley elderberry longhorn beetle will be conserved.

Objective 1.1: 2,578 acres (99%) of modeled suitable habitat for valley elderberry longhorn beetle will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to Valley Elderberry Longhorn Beetle

Goal 2: Habitat disturbances in modeled suitable habitat for valley elderberry longhorn beetle will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 2.1: Construction in modeled suitable habitat in riparian/wetlands habitat areas will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts and not anticipated to exceed 2% of modeled suitable habitat).

Objective 2.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 2.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 2.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 3: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for valley elderberry longhorn beetle.

Objective 3.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 3.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled suitable habitat.

Goal 4: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for valley elderberry longhorn beetle will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 4.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for valley elderberry longhorn beetle while continuing to provide for commercial ranching and fire protection.

Goal 5: The effects of human recreation and pet activities in modeled suitable habitat for valley elderberry longhorn beetle will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 5.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 5.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 5.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 6: The effects of other non-permanent Covered Activities on individuals and/or modeled suitable habitat for valley elderberry longhorn beetle will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 6.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 6.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of

appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

Goal 7: The adverse effects of pesticides on valley elderberry longhorn beetle will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: An Integrated Pest Management Plan will be developed and implemented in conjunction with development, ranchwide operations, and management of open space. Measures should address avoiding exposure of elderberry trees to herbicides that would damage or destroy such trees, and can include, for example, the use of herbicides that target specific vegetation in place of broad-spectrum herbicides.

7.1.1.4 MAMMALS

There are two mammals among the Covered Species: ringtail (*Bassariscus astutus*) and Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*).

7.1.1.4.1 RINGTAIL

Conservation of Modeled Suitable Habitat for Ringtail

Goal 1: Modeled suitable habitat for ringtail will be conserved.

Objective 1.1: 90,735 acres (91%) of modeled suitable habitat for ringtail will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to Ringtail

Goal 2: Direct impacts to ringtail individuals will be avoided; all lethal take of ringtail will be avoided.

Objective 2.1: Surveys prior to grading will be conducted for ringtail individuals in suitable habitat in the project disturbance zone and within 300 feet of disturbance zone 30 days prior to commencement of activities resulting in permanent ground disturbance.

Objective 2.2: If the ringtail (or sign) is detected in the project disturbance zone or within 300 feet of the disturbance zone during the breeding/rearing period (February 1 through August 31), construction activities will be avoided during the breeding/rearing period or until the project biologist has determined that the ringtail no longer occupy areas within 300 feet of the project disturbance zone. The project biologist may reduce the 300-foot setback at his or her discretion depending on the suitability of site conditions.

Objective 2.3: If the ringtail (or sign) is detected in the project disturbance zone or within 300 feet of the disturbance zone during the non-breeding/rearing period (September 1 through January 31), the project biologist will work in consultation/coordination with CDFG to implement avoidance measures (e.g., flush the ringtail from the project disturbance zone).

Objective 2.4: The project biologist will monitor construction activities in suitable habitat to assure avoidance of any harm to individuals and will have the authority to direct the cessation of field activities likely to cause any such harm.

Goal 3: Habitat disturbances in modeled suitable riparian, wash, and wetland habitat for ringtail will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities; all lethal take will be avoided.

Objective 3.1: Construction in modeled suitable riparian, wash, and wetland habitat will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts).

Objective 3.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 3.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 3.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 4: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for ringtail; all lethal take will be avoided.

Objective 4.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 4.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled suitable habitat.

Goal 5: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for ringtail will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 5.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for ringtail while continuing to provide for commercial ranching and fire protection.

Goal 6: The effects of human recreation and pet activities in modeled suitable habitat for ringtail will be avoided and effects that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 6.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 6.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 6.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 7: The effects of other permanent and non-permanent Covered Activities on individuals and/or modeled suitable habitat for ringtail will be avoided and effects that cannot be avoided will be minimized to the extent practicable; all lethal take will be avoided.

Objective 7.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 7.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 7.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.4.2 TEHACHAPI POCKET MOUSE

Conservation of Modeled Suitable Habitat for Tehachapi Pocket Mouse

Goal 1: Modeled suitable habitat for Tehachapi pocket mouse will be conserved.

Objective 1.1: 1,071 acres (95%) of modeled suitable habitat for Tehachapi pocket mouse will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Objective 1.2: All Tehachapi pocket mouse modeled habitat will be avoided, or all known locations (two occurrences located in the Oso Canyon area) will be subject to avoidance (as defined in consultation with the USFWS). If modeled habitat or known locations are not avoided, the following mitigation and minimization measures would be implemented:

(a) Research shall be conducted throughout modeled habitat in the TU MSHCP Mitigation Lands to better determine species distribution and habitat preferences. The study plan used to inform the research effort shall be reviewed and approved by the USFWS. Research shall be conducted in conjunction with any Kern County land use application for development in Oso Canyon.

(b) For the westerly occurrence area, TRC shall demonstrate a minimum of four Tehachapi pocket mouse occurrences in conserved open space through field survey work and a written survey report filed with the USFWS, upon USFWS approval of which, development of the westerly occurrence area is authorized to occur.

(c) For the easterly occurrence area, TRC shall (i) demonstrate a minimum of two additional Tehachapi pocket mouse occurrences in conserved open space through field survey work and a written survey report filed with and approved by the USFWS; and (ii) minimize effects by limiting development activities to a road and subsurface infrastructure within 150 feet of the mapped known occurrence trap line location. Prior to commencing ground disturbance activities, TRC shall consult with the USFWS to identify and implement design features (e.g., culverts beneath the road) to minimize effects in this occurrence area.

Management of Threats to Tehachapi Pocket Mouse

Goal 2: Inadvertent habitat disturbances in modeled suitable habitat for Tehachapi pocket mouse will be minimized during construction activities for commercial and residential Covered Activities.

Objective 2.1: Avoidance/minimization measures will be implemented, including fencing/flagging of disturbance/grading perimeters, contractor/construction personnel meetings prior to grading, and biological monitoring.

Goal 3: Direct impacts to Tehachapi pocket mouse individuals will be minimized during construction activities for commercial and residential Covered Activities.

Objective 3.1: Depending on the existence of essential habitat elements, a live-trapping program will be conducted for Tehachapi pocket mouse in suitable habitat in the project disturbance zone and within 100 feet of the disturbance zone no earlier than 7 days prior to commencement of activities resulting in permanent ground disturbance. In order to minimize direct impacts to individuals to the extent feasible, prior to grading a trapping program would be conducted for 5 nights in suitable habitat to trap and salvage as many individuals as possible from the disturbance zone and release them in suitable habitat away from the project disturbance zone (approximately 60% of the population within the disturbance zone is estimated to be salvaged based on a 5-night trapping program).

Objective 3.2: Construction activities will be monitored in or immediately adjacent to suitable habitat, including exclusion fencing, if appropriate, to prevent Tehachapi pocket mice from entering construction zones.

Goal 4: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for Tehachapi pocket mouse.

Objective 4.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 4.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled suitable habitat.

Goal 5: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for Tehachapi pocket mouse will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 5.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for Tehachapi pocket mouse while continuing to provide for commercial ranching and fire protection.

Goal 6: The effects of human recreation and pet activities in modeled suitable habitat for Tehachapi pocket mouse will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 6.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 6.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 7: The effects of other permanent and non-permanent Covered Activities on individuals and/or modeled suitable habitat for Tehachapi pocket mouse will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 7.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 7.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of

appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

Goal 8: The adverse effects of pesticides (rodenticides) on Tehachapi pocket mouse individuals will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 8.1: An Integrated Pest Management Plan will be developed and implemented in conjunction with development, ranchwide operations, and management of open space. Measures should address avoiding exposure of Tehachapi pocket mouse to rodenticides and can include, for example, the storage of rodenticides in secure containers and rodent-proofed facilities.

7.1.1.5 REPTILES

There are two reptiles among the Covered Species: coast horned lizard (*Phrynosoma blainvillii*) and two-striped garter snake (*Thamnophis hammondii*).

7.1.1.5.1 COAST HORNED LIZARD

Conservation of Modeled Suitable Habitat and Occurrences of Coast Horned Lizard

Goal 1: Modeled primary habitat for coast horned lizard will be conserved.

Objective 1.1: 37,074 acres (90%) of modeled primary habitat for coast horned lizard will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: Modeled secondary habitat for coast horned lizard will be conserved.

Objective 2.1: 51 acres (84%) of modeled secondary habitat for coast horned lizard will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 3: All currently known locations of coast horned lizard, as described in Section 5.2.5.1, will be conserved.

Objective 3.1: Eight currently known occurrences of coast horned lizard, as described in Section 5.2.5.1, will be conserved in the southwestern portion of the TMV Planning Area, southeast of Dry Field Canyon and north of Oso Canyon, where the majority of occurrences were found during surveys.

Management of Threats to Coast Horned Lizard

Goal 4: Habitat disturbances in modeled primary and secondary habitat for coast horned lizard will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 4.1: Construction in wash, riparian woodland, and riparian/wetland habitat will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts).

Objective 4.2: Avoidance/minimization measures in modeled primary and secondary habitat will be implemented, including fencing/flagging of disturbance/grading perimeters, contractor/construction personnel meetings prior to grading, and biological monitoring.

Goal 5: Impacts to coast horned lizard individuals will be avoided and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 5.1: Surveys prior to grading will be conducted in suitable habitat. The project biologist will make reasonable efforts to capture and relocate any observed individuals to suitable habitat that is the closest distance to the disturbance area from where the individuals were removed.

Objective 5.2: Construction activities in suitable habitat prior to grading will be monitored, including exclusion fencing, if appropriate, to prevent coast horned lizards from entering construction zones.

Goal 6: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled primary and secondary habitat for coast horned lizard.

Objective 6.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled primary and secondary habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Goal 7: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled primary and secondary habitat for coast horned lizard will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for coast horned lizard while continuing to provide for commercial ranching and fire protection.

Goal 8: The effects of human recreation and pet activities in modeled primary and secondary habitat for coast horned lizard will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 8.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 8.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 8.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 9: The effects of other non-permanent Covered Activities on individuals and/or modeled primary and secondary habitat for coast horned lizard will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 9.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 9.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 9.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.1.5.2 TWO-STRIPED GARTER SNAKE

Conservation of Modeled Suitable Habitat and Occurrences of Two-Striped Garter Snake

Goal 1: Modeled suitable habitat for two-striped garter snake will be conserved.

Objective 1.1: 254 acres (70%) of modeled suitable habitat for two-striped garter snake will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: All currently known locations of two-striped garter snake, as described in Section 5.2.5.2, will be conserved.

Objective 2.1: All currently known occurrences of two-striped garter snake, as described in Section 5.2.5.2, in the southwestern and central portions of the TMV Planning Area east of Rising Canyon, in Dry Field Canyon, and in Beartrap Canyon will be conserved.

Management of Threats to Two-Striped Garter Snake

Goal 3: Habitat disturbances in modeled suitable habitat for two-striped garter snake will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: Construction in modeled suitable habitat in riparian/wetlands habitat areas will be avoided to the extent practicable (generally anticipated to be limited to road crossings and culverts and not anticipated to exceed 9% of modeled suitable habitat).

Objective 3.2: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 3.3: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 3.4: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 4: Impacts to two-striped garter snake individuals will be avoided and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 4.1: Construction project manager will be provided two alternative options to avoid and minimize impacts to two-striped garter snake individuals:

1. Prior to grading, the project biologist will conduct daily surveys by walking through suitable habitat to be disturbed that day to clear the area of garter snakes. The project biologist will make reasonable efforts to capture and relocate any observed individuals to suitable habitat that is the closest distance to the disturbance area from where the individuals were removed.

2. The project construction manager will erect exclusion fencing around the work zone in lieu of a daily monitor. After erection of the fence or other device(s), the project biologist will perform an initial clearance survey, followed by periodic checks to verify that the fencing/device(s) are intact and functioning. Once an area has been cleared completely, additional daily monitoring and fencing/device(s) will not be required.

Goal 5: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for two-striped garter snake.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Objective 5.2: Lighting for commercial and residential Covered Activities adjacent to or near open space will be directed away from modeled suitable habitat.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for two-striped garter snake will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for two-striped garter snake while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities in modeled suitable habitat for two-striped garter snake will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Commercial and Residential Development Activities).

Objective 7.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and wildlife restrictions, including prohibition on collecting individuals (Plan-Wide Activities).

Goal 8: The effects of other non-permanent Covered Activities on individuals and/or modeled suitable habitat for two-striped garter snake will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.2 PLANT SPECIES

There are six plants among the Covered Species: Fort Tejon woolly sunflower (*Eriophyllum lanatum* var. *hallii*), Kusche's sandwort (*Arenaria macradenia var. kuschei*), round-leaved filaree (*California macrophylla*), striped adobe lily (*Fritillaria striata*), Tehachapi buckwheat (*Eriogonum callistum*), and Tejon poppy (*Eschscholzia lemmonii* ssp. *kernensis*).

7.1.2.1 FORT TEJON WOOLLY SUNFLOWER

Conservation of Modeled Suitable Habitat and Occurrences of Fort Tejon Woolly Sunflower

Goal 1: Modeled suitable habitat for Fort Tejon woolly sunflower will be conserved.

Objective 1.1: 52,046 acres (91%) of modeled suitable habitat for Fort Tejon woolly sunflower will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: All currently known occurrences of Fort Tejon woolly sunflower, as described in Section 5.3.1, will be conserved.

Objective 2.1: Thirty-six known locations, representing 3,000 to 8,500 Fort Tejon woolly sunflower individuals, as described in Section 5.3.1, will be conserved within TMV Planning Area Open Space.

Management of Threats to Fort Tejon Woolly Sunflower

Goal 3: Habitat disturbances in modeled suitable habitat for Fort Tejon woolly sunflower will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 3.2: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 3.3: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 4: Impacts to Fort Tejon woolly sunflower individuals will be avoided and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 4.1: Surveys prior to grading will be conducted in suitable habitat within 150 feet outside of the project disturbance zone for presence/absence of Fort Tejon woolly sunflower during the appropriate survey season and when the species is detectable.

Objective 4.2: Fort Tejon woolly sunflower locations will be marked with a protective barrier during construction activities occurring in proximity to known occurrences (no known occurrences exist within the development envelope), as described in Section 5.3.1, and, as deemed appropriate by the project biologist, construction activities will be monitored to minimize the potential for disturbance.

Goal 5: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for Fort Tejon woolly sunflower.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for Fort Tejon woolly sunflower will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for Fort Tejon woolly sunflower while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities in modeled suitable habitat for Fort Tejon woolly sunflower will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and a prohibition on collecting plant individuals (Commercial and Residential Development Activities).

Objective 7.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and a prohibition on collecting plant individuals (Plan-Wide Activities).

Goal 8: Avoid and minimize the effects of other permanent and non-permanent Covered Activities on individuals and/or modeled suitable habitat for Fort Tejon woolly sunflower.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.2.2 KUSCHE'S SANDWORT

Conservation of Modeled Suitable Habitat and Occurrences of Kusche's Sandwort

Goal 1: Modeled suitable habitat for Kusche's sandwort will be conserved.

Objective 1.1: 28,407 acres (93%) of modeled suitable habitat for Kusche's sandwort will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: All currently known occurrences of Kusche's sandwort, as described in Section 5.3.2, will be conserved.

Objective 2.1: Seven known occurrences, representing approximately 24 individuals, of Kusche's sandwort, as described in Section 5.3.2, will be avoided within Special Management Area 6 in the TMV Project and conserved within TMV Planning Area Open Space.

Management of Threats to Kusche's Sandwort

Goal 3: Habitat disturbances in modeled suitable habitat for Kusche's sandwort will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 3.2: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 3.3: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 4: Impacts to Kusche's sandwort individuals will be avoided and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 4.1: Surveys prior to grading will be conducted in suitable habitat within 150 feet outside of the project disturbance zone for presence/absence of Kusche's sandwort during the appropriate survey season and when the species is detectable.

Objective 4.2: Kusche's sandwort locations will be marked with a protective barrier during construction activities occurring in proximity to known occurrences, as described in Section 5.3.2, and, as deemed appropriate by the project biologist, construction activities will be monitored to minimize the potential for disturbance.

Goal 5: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for Kusche's sandwort.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for Kusche's sandwort will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for Kusche's sandwort while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities in modeled suitable habitat for Kusche's sandwort will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and a prohibition on collecting plant individuals (Commercial and Residential Development Activities).

Objective 7.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and a prohibition on collecting plant individuals (Plan-Wide Activities).

Goal 8: The effects of other non-permanent Covered Activities on individuals and/or modeled suitable habitat for Kusche's sandwort will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.2.3 ROUND-LEAVED FILAREE

Conservation of Modeled Suitable Habitat and Occurrences of Round-Leaved Filaree

Goal 1: Modeled suitable habitat for round-leaved filaree will be conserved.

Objective 1.1: 53,076 acres (91%) of modeled suitable habitat for round-leaved filaree will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: Two occurrences of round-leaved filaree, as described in Section 5.3.3, will be conserved.

Objective 2.1: Known or future detected populations of the round-leaved filaree will be conserved under two alternative scenarios:

a. Three known occurrences, representing approximately 220 to 420 (52% to 58%) individuals of round-leaved filaree, as described in Section 5.3.3, will be conserved within TMV Planning Area Open Space; or

b. At least three occurrences will be conserved in TMV Planning Area Open Space, including two known occurrences representing approximately 120 to 220 individuals and any new occurrence(s) documented within TMV Planning Area Open Space prior to development, such that the new occurrence(s) total(s) at least 100 individuals.

Management of Threats to Round-Leaved Filaree

Goal 3: Habitat disturbances in modeled suitable habitat for round-leaved filaree will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 3.2: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 3.3: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 4: Impacts to round-leaved filaree individuals will be avoided and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 4.1: Surveys prior to grading will be conducted in suitable habitat within 150 feet outside of the project disturbance zone for presence/absence of round-leaved filaree during the appropriate survey season and when the species is detectable.

Objective 4.2: Round-leaved filaree locations will be marked with a protective barrier during construction activities occurring in proximity to known occurrences, as described in Section 5.3.3, and, as deemed appropriate by the project biologist, construction activities will be monitored to minimize the potential for disturbance.

Goal 5: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for round-leaved filaree.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for round-leaved filaree will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for round-leaved filaree while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities in modeled suitable habitat for round-leaved filaree will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and a prohibition on collecting plant individuals (Commercial and Residential Development Activities).

Objective 7.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and a prohibition on collecting plant individuals (Plan-Wide Activities).

Goal 8: The effects of other non-permanent Covered Activities on individuals and/or modeled suitable habitat for round-leaved filaree will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.2.4 STRIPED ADOBE LILY

Conservation of Modeled Suitable Habitat and Occurrences of Striped Adobe Lily

Goal 1: Modeled suitable habitat for striped adobe lily will be conserved.

Objective 1.1: 29,476 acres (92%) of modeled suitable habitat for striped adobe lily will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: All currently known occurrences of striped adobe lily, as described in Section 5.3.4, will be conserved.

Objective 2.1: Three known occurrences of striped adobe lily, as described in Section 5.3.4, will be conserved within Existing Conservation Easement Areas.

Management of Threats to Striped Adobe Lily

Goal 3: Habitat disturbances in modeled suitable habitat for striped adobe lily will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 3.2: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 3.3: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 4: Impacts to striped adobe lily individuals will be avoided and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 4.1: Surveys prior to grading will be conducted in suitable habitat within 150 feet outside of the project disturbance zone for presence/absence of adobe striped lily during the appropriate survey season and when the species is detectable.

Objective 4.2: If striped adobe lily is detected, the following avoidance measure will be implemented in locations where striped adobe lily is known to occur, as described in Section 5.3.4, or was observed during surveys prior to grading.

- Grading/ground-disturbing activity will be designed to avoid permanent effects on potential pollinators by avoiding impacts to habitat within 325 feet of known striped adobe lily occurrences, as described in Section 5.3.4. The project biologist may reduce the 325-foot setback at his or her discretion depending on the suitability of site conditions.

Objective 4.3: Striped adobe lily locations will be marked with a protective barrier during construction activities occurring in proximity to known occurrences, as described in Section 5.3.4, and, as deemed appropriate by the project biologist, construction activities will be monitored to minimize the potential for disturbance.

Goal 5: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for striped adobe lily.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for striped adobe lily will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for striped adobe lily while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities in modeled suitable habitat for striped adobe lily will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and a prohibition on collecting plant individuals (Commercial and Residential Development Activities).

Objective 7.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and a prohibition on collecting plant individuals (Plan-Wide Activities).

Goal 8: The effects of other non-permanent Covered Activities on individuals and/or modeled suitable habitat for striped adobe lily will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.2.5 TEHACHAPI BUCKWHEAT

Conservation of Modeled Suitable Habitat and Occurrences of Tehachapi Buckwheat

Goal 1: Modeled suitable habitat for Tehachapi buckwheat will be conserved.

Objective 1.1: 2,562 acres (99%) of modeled suitable habitat for Tehachapi buckwheat will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Goal 2: All currently known occurrences of Tehachapi buckwheat, as described in Section 5.3.5, will be conserved.

Objective 2.1: The approximately 500 to 600 known individuals of Tehachapi buckwheat located in the vicinity of Poleline Ridge will be conserved within TMV Planning Area Open Space.

Management of Threats to Tehachapi Buckwheat

Goal 3: Habitat disturbances in modeled suitable habitat for Tehachapi buckwheat will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 3.2: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 3.3: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 4: Impacts to Tehachapi buckwheat individuals will be avoided and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 4.1: Surveys prior to grading will be conducted in suitable habitat within 325 feet outside of the project disturbance zone for presence/absence of Tehachapi buckwheat during the appropriate survey season and when the species is detectable.

Objective 4.2: If Tehachapi buckwheat is detected, the following avoidance measure will be implemented in locations where Tehachapi buckwheat is known to occur, as described in Section 5.3.5, or was observed during surveys prior to grading.

- The activity will be designed to avoid permanent edge effects by restricting Covered Activities within 325 feet of known Tehachapi buckwheat occurrences, as described in Section 5.3.5. The project biologist may reduce the 325-foot setback at his or her discretion depending on the suitability of site conditions; however, the setback would not be less than 100 feet unless approved by the USFWS.

- The land on which occurrences of Tehachapi buckwheat are avoided and the 325-foot buffer (or buffer determined by the project biologist) around the occurrences will be incorporated into Established or TMV Planning Area Open Space, and these areas will be managed for the benefit of the species.

- To preclude the invasion of Argentine ants, within the 325-foot buffer, controls will be implemented using an integrated pest management approach. The controls include (1) providing "dry zones" between development activities and buckwheat populations; (2) ensuring that dry zone container plants installed within 325 feet of buckwheat are ant free prior to installation; (3) maintaining natural hydrological conditions near the buckwheat occurrences; and (4) using drought-resistant plants in fuel modification zones to minimize irrigation requirements.

Objective 4.3: Tehachapi buckwheat locations will be marked with protective barrier during construction activities occurring in proximity to known occurrences, as described in Section 5.3.5, and, as deemed appropriate by the project biologist, construction activities will be monitored to minimize the potential for disturbance.

Objective 4.4: If construction for development activities is proposed within 325 feet of Tehachapi buckwheat occurrences (i.e., if the buffer is reduced by project biologist), the project biologist will perform weekly construction monitoring. The project biologist's construction monitoring tasks will include reviewing and approving protective fencing, dust control measures, and erosion control devices before construction work begins; conducting a contractor education session at the preconstruction meeting; and reviewing the site weekly (minimum) during construction to ensure the fencing, dust control, and BMP measures are in place and functioning correctly and that work is not directly or indirectly impacting the plants. Monitoring reports will include remedial recommendations and issue resolution discussions when necessary.

Goal 5: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for Tehachapi buckwheat.

Objective 5.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Goal 6: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for Tehachapi buckwheat will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for Tehachapi buckwheat while continuing to provide for commercial ranching and fire protection.

Goal 7: The effects of human recreation and pet activities in modeled suitable habitat for Tehachapi buckwheat will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and a prohibition on collecting plant individuals (Commercial and Residential Development Activities).

Objective 7.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 7.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and a prohibition on collecting plant individuals (Plan-Wide Activities).

Goal 8: The effects of other Covered Activities on individuals and/or modeled suitable habitat for Tehachapi buckwheat will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 8.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 8.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 8.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.1.2.6 TEJON POPPY

Conservation of Modeled Suitable Habitat and Occurrences of Tejon Poppy

Goal 1: Modeled suitable habitat for Tejon poppy will be conserved.

Objective 1.1: 12,533 acres (99%) of modeled suitable habitat for Tejon poppy will be conserved within Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas.

Management of Threats to Tejon Poppy

Goal 2: Habitat disturbances in modeled suitable habitat for Tejon poppy will be avoided and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 2.1: BMPs will be implemented to protect surface water quality (pollutants, erosion, dust control, sedimentation), as required by applicable Clean Water Act and Porter-Cologne requirements and air district requirements.

Objective 2.2: Disturbance/grading perimeters will be flagged or fenced to limit construction activities to designated areas and avoid unauthorized incursions into adjacent areas.

Objective 2.3: Contractor/construction personnel will complete meetings for training on TU MSHCP compliance and recognition/reporting protocols for Covered Species prior to grading.

Goal 3: Impacts to Tejon poppy individuals will be avoided and effects that cannot be avoided will be minimized to the extent practicable during construction activities for commercial and residential Covered Activities.

Objective 3.1: Surveys prior to grading will be conducted in suitable habitat within 150 feet outside of the project disturbance zone for presence/absence of Tejon poppy during the appropriate survey season and when the species is detectable.

Objective 3.2: Tejon poppy locations will be marked with protective barrier during construction activities occurring in proximity to known occurrences, as described in Section 5.3.6, and, as deemed appropriate by the project biologist, construction activities will be monitored to minimize the potential for disturbance.

Goal 4: Long-term (operational) impacts will be avoided and effects that cannot be avoided will be minimized to the extent practicable in modeled suitable habitat for Tejon poppy.

Objective 4.1: Design features for commercial and residential Covered Activities (as discussed in Section 7.2.1, below) will be incorporated at the boundary between modeled suitable habitat and development areas that are adequate to avoid and minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas.

Goal 5: The effects of cattle-related impacts, including fencing and ancillary ranch structures, in modeled suitable habitat for Tejon poppy will be avoided, and effects to modeled habitat that cannot be avoided will be minimized to the extent practicable.

Objective 5.1: A grazing management plan for open space will be prepared that regulates livestock grazing and range management activities to continue to maintain the habitats that are defined by the parameters in the suitable habitat model for Tejon poppy while continuing to provide for commercial ranching and fire protection.

Goal 6: The effects of human recreation and pet activities in modeled suitable habitat for Tejon poppy will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 6.1: Home Owners' Association(s) will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and a prohibition on collecting plant individuals (Commercial and Residential Development Activities).

Objective 6.2: Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS per Section 4.4.3.1.2 (Plan-Wide Activities).

Objective 6.3: TRC guests, contractors and licensees, and visitors through the Public Access Plan will be provided with educational information regarding acceptable activities in open space areas, including recreational activities, pet restrictions, and a prohibition on collecting plant individuals (Plan-Wide Activities).

Goal 7: The effects of other permanent or non-permanent Covered Activities on individuals and/or modeled suitable habitat for Tejon poppy will be avoided, and effects that cannot be avoided will be minimized to the extent practicable.

Objective 7.1: Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring.

Objective 7.2: The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.

Objective 7.3: Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.

7.2 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

7.2.1 MEASURES TO AVOID AND MINIMIZE IMPACTS

This section presents avoidance and minimization measures that will be necessary to accomplish the conservation goals and objectives of the proposed Conservation Plan for Other Covered Species listed in Section 7.1. As discussed in Section 7.1, the focus of this TU MSHCP is on assured conservation of 91% of Covered Lands. The Established Open Space and TMV Planning Area Open Space will be conserved as TU MSHCP Mitigation Lands, as discussed in Section 7.2.2, and the Exiting Conservation Easement Areas have been conserved pursuant to the Ranchwide Agreement, and during the permit term, will be managed in accordance with the TU MSHCP. The conservation strategy for each of the Covered Species is composed of species-specific goals and objectives that focus on conservation and protection of the species, avoidance and minimization measures as presented in the section, and monitoring and management.

This first subsection identifies avoidance and minimization measures to implement the Conservation Plan for Other Covered Species on the Covered Lands for the two types of Covered Activities in this TU MSHCP: Commercial and Residential Development Activities and Plan-Wide Activities.

Commercial and Residential Development Activities

The primary avoidance, minimization, and mitigation measures for this group of Covered Activities have been incorporated into the land plan for the TMV Project, the largest development activity contemplated under the TU MSHCP, including the preservation of 23,001 acres of open space within sensitive biological areas of the TMV Planning Area. Further avoidance and minimization measures in the remaining acreage of the TMV Planning Area and the Lebec/Existing Headquarters Area include the following.

Design Measures include**:**

- Setbacks will be incorporated into the design of Commercial and Residential Development Activities located at the boundary of open space areas identified in this TU MSHCP. Measures that are adequate to avoid or minimize the introduction of exotic plant and animal species, such as Argentine ant, and urban runoff in adjacent natural areas will be implemented. This measure will benefit each of the Covered Species.

- Ground disturbances in connection with Commercial and Residential Development Activities will be avoided in riparian areas to the extent practicable (generally, such ground disturbance is anticipated to be limited to disturbance necessary for road crossings and culverts). This measure will benefit each of the Covered Species except: burrowing owl, golden eagle, purple martin, Tehachapi pocket mouse, striped adobe lily, Tehachapi buckwheat, and Tejon poppy, which do not use or occur in riparian habitat.

- Downcast lighting will be required for commercial and residential Covered Activities located at or near the boundary of open space areas identified in this TU MSHCP. This measure will benefit each of the Covered Species.

- No development, new trails, or recreational activities will occur within 0.25 mile of an active primary golden eagle nest and/or active alternate nest, within or outside of the Viewshed; no development will occur within the Viewshed that is also within 0.5 mile of an active nest; and siting and design criteria to minimize loss of foraging habitat will apply between 0.5 mile and 1.0 mile within the nest Viewshed. These measures will benefit golden eagle.

- Within 1 mile of Castac Lake, the project biologist will identify preferred diurnal perches and high-quality roost trees (trees with greater than 12-inch diameter at breast height) for bald eagles for conservation, as approved by the Kern County Fire Department. Management standards will be applied to these preferred diurnal perches and high-quality roost trees; the management standards may include selectively thinning, planting, and girdling trees. The project biologist will also identify for preservation preferred roosting areas that are well-protected from wind (e.g., in a canyon or blocked by trees), including an adequate setback from preserved roosting areas determined by the project biologist, and based on site-specific surveys conducted prior or approval of grading plans. This measure will benefit golden eagle and bald eagle.

- Design features will be incorporated at the boundaries between riparian/wetland modeled foraging and wintering habitat for special-status birds (as indicated in Section 7.1) and development that are adequate to avoid and minimize the introduction of exotic plant and animal species and urban runoff in adjacent natural areas (e.g., restrictions on landscape watering, grading so as to direct runoff away from open space, landscaping restrictions to prohibit use of invasive, non-native species, and restrictions on pesticide use provided in the Integrated Pest Management Plan also constitute design measures). This measure will benefit each of the Covered Species except: burrowing owl, golden eagle, purple martin, Tehachapi pocket mouse, striped adobe lily, Tehachapi buckwheat, and Tejon poppy.

- Design development activity to avoid permanent effects on potential pollinators by avoiding impacts to modeled habitat within 325 feet of striped adobe lily and Tehachapi buckwheat known occurrences. This measure will benefit striped adobe lily and Tehachapi buckwheat.

Construction measures to be implemented prior to grading include:

- Conduct surveys prior to grading in suitable habitat areas for wildlife Covered Species (except valley elderberry longhorn beetle). Trapping studies for Tehachapi pocket mouse will be conducted in areas that contain essential habitat for the species. This measure will benefit all Covered Species, except valley elderberry longhorn beetle.

- For occupied native bird nests, the project biologist will establish appropriate buffers for active nests detected during surveys prior to grading, in compliance with applicable regulatory protocols (and/or objectives listed above). Active nests and designated buffers will be shown on appropriate planning maps. Construction within the buffers will be avoided until the nests are abandoned or until the young have fledged or been reared. This measure will benefit all avian Covered Species.

- Implement contractor/construction personnel meetings with educational information about TU MSHCP requirements and Covered Species prior to grading. Fence or flag disturbance/grading perimeters to identify extent of authorized disturbance areas and boundary of non-disturbance areas. This measure will benefit each of the Covered Species.

- Conduct surveys prior to grading in suitable habitat within 150 feet outside of the project disturbance zone for presence/absence of plant Covered Species. This measure will benefit Fort Tejon woolly sunflower, Kusche's sandwort, round-leaved filaree, striped adobe lily, and Tehachapi buckwheat.

- For the Tehachapi buckwheat, no occurrences are known or likely to exist within the TMV Planning Area or Lebec/Existing Headquarters Area identified for Commercial and Residential Development Activities. If new occurrences are detected during surveys prior to grading, impacts to individuals will be avoided or minimized to the extent practicable. To avoid edge effects, Covered Activities within 325 feet of known individuals will be restricted. Avoided new occurrences and the 325-foot buffer around individuals will be incorporated into Established or TMV Planning Area Open Space.

Construction-related measures include:

- Implement BMPs to protect surface water quality (pollutants, erosion, dust control, sedimentation) during construction in compliance with Clean Water Act and Porter-Cologne requirements and air district requirements. This measure will benefit each of the Covered Species.

- For Fully Protected species, the project biologist will monitor construction activities to assure avoidance of any take to individuals and will have the authority to direct the cessation of field activities likely to cause any such harm. This measure will benefit all Fully Protected Covered Species.

- If construction for development activities is proposed within 325 feet of Tehachapi buckwheat known occurrences, the project biologist will perform weekly construction monitoring to ensure avoidance of construction activities in Tehachapi buckwheat occurrence area. This measure will benefit Tehachapi buckwheat.

Long-term (operational) measures include:

- Home Owners' Association(s), TRC guests, contractors and licensees, and visitors will be provided with educational information regarding acceptable activities in open space areas, as reviewed and approved by the Tejon Staff Biologist, including recreational activities, pet restrictions, and wildlife restrictions. This measure will benefit each of the Covered Species.

- CC&Rs will prohibit the feeding of the California condor, bald eagle, and other wildlife species on the Covered Lands. This measure will benefit each of the 20 wildlife Other Covered Species.

- Signage will be installed adjacent to Castac Lake indicating that feeding bald eagles is prohibited, and appropriate signage will be installed near commercial and project recreational use areas reminding users of prohibited activities (such as wildlife feeding) within open space areas. Such signage will indicate that prohibitions will be enforceable for all residents and guests. This measure will benefit bald eagle.

- An Integrated Pest Management Plan, which will be subject to USFWS review, will be developed and implemented in conjunction with development, ranchwide operations, and management of Open Space. The Integrated Pest Management Plan will address potential conflicts with native burrowing animals. Implementation of the Integrated Pest Management Plan will address avoidance measures related to fertilizers, pesticides, and water quality, but the Integrated Pest Management Plan will also provide mitigation by providing guidelines for the eradication of non-native, invasive plant and animal species, including bullfrogs and Argentine ant. The use of rodenticides will be avoided to the maximum extent practicable. This measure will benefit each of the Covered Species.

- Maintain design features to avoid edge effects, discussed above.

Plan-Wide Activities

Avoidance and minimization measures related to Plan-Wide Activities are described below.

- **A grazing management plan**, which will be subject to USFWS review and approval for consistency with the TU MSHCP and the Federal Endangered Species Act (FESA), will be prepared that regulates livestock grazing and range management activities to continue to maintain existing modeled habitat for Covered Species while continuing to provide for commercial ranching, fire protection, and carcass feeding opportunities for California condors. The plan will benefit each of the Covered Species and shall incorporate the following principles:

    - Cattle grazing shall continue to be consistent with light-to-moderate grazing levels comparable to past and current grazing practices and limited to a maximum of 14,500 head of cattle on Tejon Ranch, including within Covered Lands, rotated seasonally.

    - Grazing management techniques that would continue would include (1) grazing practices that have been shown to be consistent with high levels of biodiversity and species populations, which may include exclusion fencing in riparian areas, and (2) seasonal grazing and related rotational practices that are important for protecting specific Covered Species. The purpose of seasonal exclusions is to remove cattle from a specific area for a specific time period for the benefit of a specific resource or species.

    - The grazing management plan will be submitted for review and approval by USFWS within 18 months following permit issuance.

- Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2 and results of annual monitoring. This measure will benefit each of the Covered Species. Repair, maintenance, construction, and use of roads and maintenance and construction of utilities within open space areas (as described in Section 2.2.1) will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing as warranted. This measure will benefit each of the Covered Species.

- The selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas. Additionally, the review and approval of the Conservancy-managed access plan by USFWS in perpetuity will assure minimization of impacts. This measure will benefit each of the Covered Species.

- An Integrated Pest Management Plan will be developed and implemented in conjunction with development, ranchwide operations, and management of Open Space as discussed above for Commercial and Residential Development Activities.

- Implementation of Federal and state regulatory requirements for riparian areas in conjunction with Plan-Wide Activities will avoid and minimize impacts to modeled suitable habitat for Covered Species associated with riparian areas. The existing Federal and state regulatory structure is described in Section 1.5.5.

In addition to the avoidance and minimization measures noted above for Commercial and Residential Development Activities and Plan-Wide Activities, a number of the species-specific objectives presented in Section 7.1 include action items to be undertaken in conjunction with implementation of Covered Activities. These action-oriented objectives are summarized in *Table 7-1* and in the funding plan presented in *Section 9, Funding*. Implementation of these action-oriented objectives, together with the avoidance and minimization measures noted below, form key elements of the conservation strategy for the Covered Species.

Table 7-1. Summary of Measures to Avoid and Minimize Impacts to Covered Species

Action	Species	Assumptions / Notes
Pre-activity surveys for Covered Activities not related to commercial and residential construction will be conducted.	Western spadefoot; American peregrine falcon	Grazing activities for spadefoot and recreational activities for falcon
Preferred diurnal perches and roosting areas will be mapped and avoided. Management standards and setbacks will be applied to preferred diurnal perches and high-quality roost trees.	Bald eagle	—
Signage adjacent to Castac Lake will be installed indicating that feeding bald eagles is prohibited and indicating that prohibitions will be enforceable against all residents and guests.	Bald eagle	—
Interpretive and educational signage will be installed at Castac Lake, informing the public about bald eagles, their habitat requirements, and their sensitivity to human disturbance during the wintering season for the species (late October through March).	Bald eagle	—
If nesting individuals are found in surveys prior to grading, implement setbacks. Submit results of surveys and relocation efforts to California Department of Fish and Game (CDFG).	Burrowing owl	—
If active golden eagle nest sites (primary or alternate) are observed on site during the survey, a nest-specific analysis will be prepared to identify the primary nest and establish its viewshed (the "Viewshed").	Golden eagle	—
Surveys for breeding birds will be conducted for construction activities scheduled in the breeding season in or immediately adjacent to suitable breeding habitat.	All avian Covered Species	Any Fully Protected species and/or active bird nests will be avoided
For occupied bird nests, the project biologist will establish appropriate buffers for active nests detected during surveys prior to grading, in compliance with applicable regulatory protocols. Active nests and designated buffers will be shown on appropriate planning maps. Construction within the buffers will be avoided until the nests are abandoned or until the young have fledged or have been reared.	All native avian Covered Species	—
European starling monitoring, removal, and management methods will be implemented if determined necessary by the project biologist.	Purple martin	—
Prior to implementation of European starling management measures, the project biologist will develop a management plan.	Purple martin	—
Prior to grading, a live-trapping program will be conducted for Tehachapi pocket mouse in areas with essential habitat for the species in the project disturbance zone and within 100 feet of disturbance zone no earlier than 7 days prior to commencement of activities resulting in permanent ground disturbance. The trapping program would be conducted for 5 nights prior to grading in suitable habitat to trap and remove as many individuals as possible and relocate them to suitable habitat away from the project disturbance zone.	Tehachapi pocket mouse	—
If construction for development activities is proposed within 325 feet of Tehachapi buckwheat occurrences, the project biologist will perform weekly construction monitoring. The monitoring tasks will include reviewing and approving protective fencing, dust control measures, and erosion control devices before construction work begins; conducting a contractor education session at the preconstruction meeting; and reviewing the site weekly (minimum) during construction to ensure the fencing, dust control, and best management practice (BMP) measures are in place and functioning correctly and that work is not directly or indirectly impacting the plants. Monitoring reports will include remedial recommendations and issue resolution discussions when necessary.	Tehachapi buckwheat	—

Table 7-1 (Continued)

Action	Species	Assumptions / Notes
Prior to grading, the project biologist will make reasonable efforts to capture and relocate any observed individuals to suitable habitat that is the closest distance to the disturbance area from where the individuals were removed. Relocation of observed individuals may be undertaken consistent with the appropriate scientific collection permits; all handling of amphibians shall be conducted in accordance with the fieldwork code of practice developed by the Declining Amphibian Populations Task Force (DAPTF 2009).	All amphibians and reptiles	—
Surveys prior to grading will be conducted in suitable habitat.	All amphibians	Species to be surveyed will depend upon habitat suitability
Construction activities in modeled suitable habitat will be monitored.	All amphibians	—
Grazing management plan (implementation and monitoring) for open space.	All amphibians	—
Establishment of setbacks in design features of development that will be mapped to protect species.	All	—
Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2.	All	—
Conduct surveys prior to grading in suitable habitat areas for Fully Protected ringtail and Tehachapi buckwheat.	Ringtail and Tehachapi buckwheat	Impacts to ringtail individuals will be avoided
For Fully Protected species, the project biologist will monitor construction activities to ensure avoidance of any take to individuals and will have the authority to direct the cessation of field activities likely to cause any such harm.	All Fully Protected Covered Species	—
Implement contractor/construction personnel meetings with educational information about TU MSHCP requirements and Covered Species prior to grading.	All	—
Fence or flag disturbance/grading perimeters to identify extent of authorized disturbance areas and boundary of non-disturbance areas.	All	—
Implement BMPs to protect surface water quality (pollutants, erosion, dust control, and sedimentation) during construction in compliance with Clean Water Act and Porter-Cologne requirements and air district requirements.	All	—
CC&Rs for each parcel will prohibit the feeding of the California condor, bald eagle, and other wildlife species.	All	—
Home Owners' Association(s), TRC guests, contractors and licensees, and public visitors will be provided with educational information regarding the Covered Species and acceptable recreational activities, pet restrictions, and wildlife restrictions in open space areas.	All	—
An Integrated Pest Management Plan will be developed and implemented (including measures to control and eradicate non-native, invasive species, including bullfrogs and Argentine ant) in conjunction with development, ranchwide operations, and management of Open Space.	All	—
The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space areas will include efforts to minimize the footprint and use BMPs for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.	All	—
Selection of any new public access trails shall be made in consultation with the project biologist, and the selection of appropriate locations for access, trails and facilities will minimize impacts to the open space areas.	All	—

7.2.2 MEASURES TO MITIGATE UNAVOIDABLE IMPACTS

In addition to the avoidance and minimization measures described in Section 7.2.1, the Applicant proposes the following measures to mitigate unavoidable impacts of the project.

Open Space Areas

The primary mitigation associated with the project is land conservation, including the dedication and preservation of the TU MSHCP Mitigation Lands: 93,522 acres of Established Open Space (including the Condor Study Area) and 23,001 acres of TMV Planning Area Open Space, as well conservation of the 12,795 acres of Existing Conservation Easement Areas, which have been permanently preserved pursuant to the Ranchwide Agreement. Dedicated conservation of the TU MSHCP Mitigation Lands will be phased. Upon initiation of construction of the TMV Project, the TU MSHCP Mitigation Lands shall be permanently protected by phased recordation of conservation easements or equivalent legal restrictions over the Initial and Remaining TU MSHCP Mitigation Lands by the end of the permit term.

These areas, totaling 91% (129,318 acres) of Covered Lands, will be conserved and managed in perpetuity as open space. The lands to be conserved as part of the TU MSHCP will be adjacent to lands outside Covered Lands but within Tejon Ranch ownership to be protected as part of the Ranchwide Agreement. The total open space will be approximately 240,000 acres. The level of mitigation provided by the TU MSHCP, in combination with open space provided by the Ranchwide Agreement, is consistent with conservation biology principles calling for large, interconnected blocks of habitat that support the life history requirements of the Covered Species. This level of mitigation will ensure conservation of these species on the Covered Lands and is consistent with recovery of the Federally listed Covered Species.

Additional Mitigation

In addition to the open space system, habitat restoration/enhancement for unavoidable impacts to riparian/wetlands under a no-net-loss policy, consistent with wetland permitting requirements by the U.S. Army Corps and/or the Regional Water Quality Control Board is required, including any specific restoration within the Covered Lands, as required by those agencies. The goal of restoration is to emulate the structure, functions and services, diversity, and dynamics of the habitat or ecosystem. This goal generally will be achieved through compliance with the Clean Water Act requirements for creation, enhancement, and restoration of wetlands/riparian habitats.

7.3 MONITORING MEASURES

Two types of monitoring will be carried out pursuant to the Section 10(a)(10)(B) Incidental Take Permit (ITP) issued to TRC.

1. *Compliance Monitoring* to verify that TRC is carrying out the terms of the TU MSHCP and Implementing Agreement (*Appendix C*); and
2. *Effectiveness Monitoring* of Covered Species and their habitats to determine the effectiveness of conservation plan and management measures in terms of promoting species survival and recovery.

7.3.1 COMPLIANCE MONITORING

Compliance monitoring tracks the status of TU MSHCP implementation and refers primarily to administrative duties related to verifying that the Permittees are carrying out the terms of the TU MSHCP, the permit, and the Implementing Agreement. Compliance monitoring information includes a summary of dates of completion, revisions, and implementation progress on the following TU MSHCP components:

- Impacts to Covered Species and/or their modeled suitable habitat as a result of Covered Activities during the prior year (based on assessment of impacts to vegetation communities as discussed below and summarized in *Table 7-2*);
- Status of lands added to the open space system, including Established Open Space and TMV Planning Area Open Space;
- Avoidance and minimization measures implemented in relation to Commercial and Residential Development Activities;
- Construction training would occur prior to grading at the start of each construction event. Construction training will be geared toward ensuring that construction personnel for each construction event are properly informed of relevant TU MSHCP Covered Species goals, objectives, and avoidance and minimization measures prior to grading. Construction monitoring reports will be used to measure the effectiveness of the construction training.

Impacts to California condor will be assessed based on the measures presented in *Section 4, California Condor*, of this TU MSHCP.

No take is allocated for plants in this TU MSHCP and impacts to plants, if observed, will be reported qualitatively and as part of the annual assessment of impacts to vegetation communities.

Impacts to the 20 wildlife Other Covered Species will be tracked. This information is necessary to assess the TU MSHCP's impacts on the Covered Species and to delineate the extent of take authorized under the ITP. A full discussion of the TU MSHCP's effects on each of the 20 wildlife Other Covered Species is found in Section 6.2, including quantification of take on the basis of reduction of modeled suitable habitat, as well as analysis of the impacts of the taking on the species as a whole. In that assessment, available information regarding the size of territories or home ranges were also used to provide an estimate of the number of individuals such an area could sustain, if the habitat area were fully saturated. Finally, the analysis assessed whether an equivalent number of individuals would actually be lost, although in most instances habitat areas are not known to be occupied at saturation, so the actual loss of individuals would typically be a substantially smaller but unknown number. The rationale for providing the take estimates is provided for each of the 20 wildlife Other Covered Species in Section 6.2.

As discussed in Section 6.2, incidental take of the 20 wildlife Other Covered Species will be difficult to detect or quantify for the following reasons: (1) species' use of the habitat is intermittent and transitory, particularly for species not known to breed within Covered Lands; (2) life history characteristics of certain species, particularly crypto-fossorial species, make them difficult to observe during certain life stages; (3) species occur in inaccessible habitats or have secretive or cryptic habits that make them difficult to detect; (4) species distribution within Covered Lands is patchy and/or not fully known; (5) certain species populations are subject to seasonal and other fluctuations; and (6) certain species' relatively small body size makes the finding of a dead specimen unlikely.

Therefore, it is anticipated that the potential incidental take of the 20 wildlife Other Covered Species will occur with the loss of up to 5,533 of the 8,817 acres[1] of habitat shown in *Table 7-2*. Anticipated take of the 20 wildlife Other Covered Species will be measured in terms of the modeled habitat acres affected by Covered Activities shown in *Table 7-2*.

1 The 5,533 acres includes the following: TMV Planning Area (5,082 acres for TMV Specific Plan Area and Oso Canyon, 170 acres West of Freeway); 265 acres Lebec/Headquarters Area; 16 acres Tejon-Castac Water District (TCWD) facilities. As described in Section 2, the 5,082 acres described for the TMV Specific Plan Area occur within a 7,860-acre development envelope. Because the exact development envelope is not known, it was not possible to determine which vegetation communities within that 7,860-acre development envelope would be impacted by up to 5,082 acres of development. Given this constraint, this TU MSHCP overstates the impacts and assumes 100% impact of the 7,860-acre development envelope for the purposes of biological analysis for take of Covered Species; however, it should be emphasized that this assumption is for analysis purposes only and no more than 5,082 acres will be impacted by development within the 7,860-acre development envelope. Therefore, a total development envelope of 8,817 acres is shown as impacted in the table. An additional 200 acres of ground disturbance are qualitatively analyzed for ground disturbance related to Plan-Wide Activities.

Table 7-2. Take Requested by Vegetation Community in Covered Lands

Vegetation Type	Total Acres Requested for Impact in Covered Lands (acres)
Upland Communities	
Scrubs	326
Chaparrals	814
Grasslands	2,485
Savannahs	2,046
Woodland	2,643
Conifer Forest	73
Riparian/Wetland Communities	
Riparian Scrub	5
Riparian/Wetland	2
Wetland	22
Lake	0
Riparian Woodland	1
Wash	1
Non-Native Land Covers	
Agriculture[1]	227
Total	**8,645[2]**

Notes:
[1] Acreage total is for mapped agriculture vegetation communities that support elements of the life history requirements for certain Covered Species, such as foraging needs for raptors.
[2] The total acreage presented in this table is 172 acres less than the total development envelope acreage (8,817 acres) presented in *Section 2, Table 2-1*, for two reasons. First, 88 acres of developed areas are not included in the total acreage because developed areas do not serve as suitable habitat for any of the Covered Species. Secondly, the analysis assumes 75% avoidance of effects on riparian/wetland vegetation communities. The total acres reflect this assumption, as well as the acres for riparian vegetation communities and species models that are based on these riparian communities. Therefore, 84 acres of riparian/wetland vegetation are not included in this table. This is a conservative assumption, as the Clean Water Act 404(b)(1) alternatives analysis submitted to U.S. Army Corps Engineers for the TMV Project shows avoidance of 99% of the Federally jurisdictional wetland areas and avoidance of 97% of the state and Federal jurisdictional waters overall.

In addition to the assessment of impacts to vegetation communities, status of lands added to the open space system, status of implementation of avoidance and minimization measures, and expenditure of funds will be documented in annual reports.

Annual reports will provide at minimum the following information:

- A summary of impacts to Covered Species and/or their modeled suitable habitat as a result of Covered Activities in the previous year (based on assessment of impacts to vegetation communities), including quantified permanent impacts resulting from Covered Activities and a qualitative description of impacts from non-permanent Covered Activities, as appropriate

- A summary of the quantified cumulative permanent impacts to Covered Species and/or their modeled suitable habitat as a result of Covered Activities since issuance of the permit

- A summary of the lands added to the open space system, including Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas
- A description of any TU MSHCP amendments proposed or approved during the prior year
- A description of any clerical corrections made to the TU MSHCP during the prior year.

With regard to effectiveness monitoring, the annual reports will provide at minimum a description of the monitoring and management actions carried out during the prior year, including the following:

- Data and information about who collected the data and the frequency, timing, and duration of data collection
- A description of the data analysis and results
- Synthesis/integration of the year's monitoring and management results with previous years as applicable (e.g., analyzing apparent trends)
- Identification of any significant problems or successes with the program that may alter the monitoring and management program approach
- Suggested changes/revisions to the monitoring and management program, if any, based on the points listed above
- Documentation of changed or unforeseen circumstances that occurred during the previous reporting year and how they were addressed
- Discussion of triggers for adaptive management and how they were implemented.

7.3.2 EFFECTIVENESS MONITORING

Overall, the effectiveness monitoring program will assess the biological conditions in the open space system resulting from implementation of the Conservation Plan for Other Covered Species and provide any information needed to implement an adaptive management strategy. Habitat conservation objectives are established for each of the Covered Species based on the amount of modeled suitable habitat that will be included in Established Open Space, TMV Planning Area Open Space, and Existing Conservation Easement Areas. Effectiveness monitoring may include landscape-level vegetation community mapping updates using aerial photography to assess whether the general habitat acreages are in balance with those identified in the conservation plan in this section. Selective on-the-ground monitoring in certain areas may be required to assess whether native vegetation communities are being invaded by exotic species and thus reducing habitat values for Covered Species.

Several goals relate to Plan-Wide Activities, such as cattle grazing, human recreation, film production, roads, and utilities. A component of effectiveness monitoring will be to monitor whether the objectives related to these goals are being met. For example, where seasonal cattle exclusions are implemented to protect riparian/wetland resources, periodic monitoring of these resources will be conducted to evaluate whether the exclusions occurred and their effectiveness in protecting riparian/wetland resources. Similarly, trail use will be monitored to determine whether unauthorized activity is occurring in open space areas and what measures can be implemented to reduce such activities, such as closures, increased patrols, and signage.

Effectiveness monitoring will be linked to the categories of avoidance and minimization measures identified in Section 7.2. The following is a description of the various categories of effectiveness monitoring.

Baseline Surveys – Establishment of Resource Baseline in Open Space Areas

The purpose of the baseline surveys is to establish the resource baseline from which effectiveness monitoring can be measured in the open space. Baseline surveys have been completed for the TMV Planning Area Open Space. For the open space areas outside of the TMV Planning Area within Covered Lands, existing data will be compiled and augmented as necessary for habitat supporting Covered Species. As noted in *Section 3, Environmental Setting*, of this TU MSHCP, substantial baseline data exist for the Covered Lands, including vegetation mapping, soils mapping, topographic information, species occurrence data, and other information. Existing data will be used as much as possible to establish the resource baseline. This information will be augmented as needed to assemble a database sufficient to implement the compliance monitoring and reporting requirements outlined in Section 7.3.1. The established resource baseline will be described and documented in the first annual report following permit issuance.

Activities Associated with Commercial and Residential Development Activities

Surveys Prior to Grading

Surveys prior to grading will identify which areas require avoidance monitoring. Species may be monitored together (i.e., species that have overlapping breeding seasons and habitat) to avoid redundancy. Survey reports will be prepared and used as a tool to monitor the effectiveness of surveys done prior to grading, and this information will be included in the annual report.

Relocation

Relocation activities prior to construction may occur for several species. These activities involve relocation of certain covered reptile and amphibian species to suitable open space areas if they are located during surveys done prior to grading. The project biologist will make reasonable efforts to capture and relocate any observed individuals to suitable habitat that is the closest distance to the disturbance area from where the individuals were removed. Any relocation activities would be undertaken with the appropriate USFWS/CDFG authorizations. Relocation activities, if any, will be documented and, if appropriate, monitored for effectiveness by, for example, walkover surveys of relocation areas to observe whether habitat conditions remain favorable for the relocated species and, if possible, observe species presence. Information on relocations, if any, will be included in the annual report.

Avoidance Monitoring

Avoidance monitoring measures include additional monitoring efforts that occur during construction following identification of Covered Species in proximity to Covered Activities that may affect the species. The effectiveness of avoidance monitoring will be documented for each monitoring activity to assure, for example, that species toward which additional monitoring efforts are directed during construction are protected. Such monitoring may include avoidance during construction of an observed plan population, for example. Monitoring reports will be included in the annual reports referenced in Section 7.3.1.

Activities Associated with Plan-Wide Activities

Grazing Management

The grazing management plan, which will be subject to USFWS review and approval for consistency with the TU MSHCP and the FESA per the terms of the Implementing Agreement, will be prepared within 18 months of permit issuance. As noted in Section 7.2.1, principles to be incorporated in the grazing management plan include assurance that grazing continues to occur at existing or reduced levels and incorporation of grazing management techniques that have been shown to be consistent with high levels of biological diversity and robust species populations. The grazing management plan will incorporate monitoring requirements to ensure that these principles are carried out.

Fuel Management Plan

The Fuel Management Plan, which will be subject to USFWS review per the terms of the Implementing Agreement, will be submitted to reflect requirements related to the maintenance of fuel modification zones created by 1) existing roads; 2) through irrigation and /or vegetation clearing and mowing within 120 feet surrounding existing structures (i.e., back country cabins, ancillary ranch structures, and existing structures; and 3) as required by Kern County and the State of California along county and state roads.

Integrated Pest Management

The Integrated Pest Management Plan, which will be subject to USFWS review per the terms of the Implementing Agreement, will initially consist of a framework plan followed by the submittal of more detailed plans relating to the golf course, resort, and common open space to Kern County and will include invasive species control measures including the specific requirements for invasive species control identified for Tehachapi buckwheat and purple martin (to be completed concurrently with landscape improvement plans). The goal of the Integrated Pest Management Plan is to avoid and minimize threats to Covered Species associated with fertilizers, pesticides, and invasions by non-native species. The Integrated Pest Management Plan will incorporate monitoring measures to ensure these goals are achieved.

Public Access

Public recreation, as managed by the Conservancy, shall be regulated through the Public Access Plan, which shall be reviewed and approved by USFWS for consistency with the TU MSHCP and FESA, per the terms of the Implementing Agreement. The goal of the Public Access Plan is to ensure that the public recreational facilities are planned and carried out consistent with the terms of the TU MSHCP and in such a way that avoids and minimizes effects on Covered Species.

Ongoing Avoidance in Conjunction with Plan-Wide Activities

Use and maintenance of ranch roads, installation of infrastructure within open space areas, and the selection of appropriate locations for access, trails, and facilities per the Public Access Plan, which will be subject to USFWS review and approval for consistency with the TU MSHCP and the FESA, as noted above, will be subject to construction and avoidance monitoring consistent with the level of effort appropriate for the particular activity. The project biologist will oversee implementation of these activities.

7.4 OTHER MANAGEMENT MEASURES

The Ranchwide Agreement (TRC et al. 2008) requires the preparation of a management plan for the ranch lands that are proposed to be conserved as part of the agreement. Proposed open space would include 93,522 acres of Established Open Space, 23,001 acres of TMV Planning Area Open Space, and 12,795 acres of Existing Conservation Easement Areas. The Conservancy will work with TRC on the development of a Ranch-Wide Management Plan (RWMP) over the areas to be held in easement by the Conservancy pursuant to the Ranchwide Agreement to help preserve, protect, and enhance the conservation values of the open space areas of Tejon Ranch, and to help facilitate public access and educational programs (an Interim RWMP was adopted by the Conservancy on September 18, 2009, that provides for the existing BMPs for the existing and ongoing ranch uses and establishes a process and timeline—including the identification of information needs—to further develop a comprehensive RWMP). The RWMP will be subject to

USFWS review and approval for consistency with the TU MSHCP and the FESA per the terms of the Implementing Agreement.

Reinitiation Statement

As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount of extent of incidental take is exceeded; (2) new information reveals that the agency action may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this TU MSHCP; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount of extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. The Incidental Take Statement provided for unlisted Covered Species does not become effective until an unlisted Covered Species is listed.

7.5 ADAPTIVE MANAGEMENT STRATEGY

Adaptive Management Framework

Guidance regarding adaptive management programs for habitat conservation plans (HCPs) is provided in Section 3.B.3.g of the USFWS/National Marine Fisheries Service (NMFS) Habitat Conservation Planning Handbook (November 1996) and in the handbook’s five-point Addendum dated June 1, 2000. The Federal Register notice for the Addendum (65 FR 35242–35257) contains the following guidance regarding adaptive management programs.

- An adaptive management approach allows for up-front mutually agreed-upon changes in an HCP’s operating conservation plan that may be necessary for Covered Species in light of new information. In order to be successfully implemented, adaptive management provisions must be linked to measurable biological goals and monitoring.

- Not all HCPs or all species covered in an ITP need an adaptive management strategy. However, an adaptive management strategy is essential for permits that cover species that have biological data or information gaps that incur a significant risk to that species. Possible significant data gaps that could lead to the development of an adaptive management strategy include, but are not limited to, significant biological uncertainty about significant information about the ecology of the species or its habitat (e.g., food preferences, relative importance of predators, territory size), habitat or species management techniques, or the degree of potential effects of the activity on the species covered in the ITP.

Management/Adaptive Management Goals

The overriding management goal of this TU MSHCP is to establish and maintain a self-sustaining conservation area that focuses on achieving the measurable goals and objectives identified for the Covered Species in *Sections 4* and *7* of this TU MSHCP. Ecosystems are dynamic environments of interacting processes and biotic and abiotic components, and ecological processes are not linear. They may function at different spatial and temporal scales. Consequently, adaptive management of ecosystems, landscapes, and associated species requires a flexible, inductive approach where ecological theory and field experimentation are combined to monitor the status of the system and respond to the unexpected. The adaptive management plan for this TU MSHCP encourages such a "learning by doing" approach.

The adaptive management approach reflects the strong conservation orientation of this TU MSHCP, with 116,523 acres (82%) of Covered Lands retained in permanent open space as TU MSHCP Mitigation Lands and an additional 12,795 acres for which conservation easements have been acquired (Existing Conservation Easement Areas). These areas, totaling 91% of Covered Lands, will be conserved in perpetuity as open space. As described in the TU MSHCP, the Covered Lands have been owned and used for ranching by TRC for many years, and a goal of the TU MSHCP is to maintain the stewardship that has been provided by TRC. As such, a focus of the management program will be to continue with existing land use practices that have resulted in the high-quality habitat currently present within Covered Lands. With implementation of Covered Activities, human presence will increase somewhat in conjunction with commercial and residential development. Management and adaptive management activities will be directed toward avoiding and minimizing threats to Covered Species that may result from increased human presence in or immediately adjacent to conserved open space. Measures to manage these threats are also included in the species goals and objectives presented in Section 7.1.

Adaptive management measures undertaken as part of this TU MSHCP will be coordinated with the management strategies and adaptive management standards as they emerge for the Ranchwide Agreement (TRC et al. 2008). In particular, sharing of baseline information and monitoring and reporting data in an accessible, uniform database will facilitate adaptive management efforts. Certain adaptive management activities such as exotics control or grazing management, if carried out within Covered Lands as well as ranch-wide, may increase research value and benefits for Covered Species. The information contained in the TU MSHCP annual report as described in Section 7.3.1 will be used to facilitate this coordination process.

The specific adaptive management measures implemented may require a minor modification to the TU MSHCP (see *Section 8, Changed Circumstances and Plan Implementation*).

8. CHANGED CIRCUMSTANCES AND PLAN IMPLEMENTATION

8.1 CHANGED CIRCUMSTANCES

"Changed circumstances" are defined under the Federal "No Surprises Rule" at 50 CFR 17.3 as "changes in circumstances affecting a species or geographic area covered by a conservation plan or agreement that can reasonably be anticipated by plan or agreement developers and the [U.S. Fish and Wildlife Service (USFWS)] and that can be planned for." Changed circumstances potentially affecting the Covered Lands are defined as future events for which it is reasonably foreseeable that such an event may occur during the life of the Incidental Take Permit (ITP), and that may negatively affect the Covered Species and/or their associated habitat within the Covered Lands. Changed circumstances addressed by the Tehachapi Uplands Multiple Species Habitat Conservation Plan (TU MSHCP) include the following:

- Drought/climate change
- Fire/climate change
- New listings of species/designation of critical habitat not covered by the TU MSHCP.

8.1.1 DROUGHT/CLIMATE CHANGE

For the purpose of defining changed circumstances, drought is defined as climatic drought at least 3 years in length, as declared by the California Department of Water Resources.

Risk Assessment

Drought is a cyclical weather phenomenon that is beyond human control. Some forecasters predict that the cycle of drought has become and may be more frequent in the future due to climate change. Drought is not uncommon in Southern California, and it is a phenomenon to which local natural communities and species have adapted over time. Drought occurs slowly over a multiyear period, differing from the catastrophic events of fire and flood, which occur rapidly and afford little time for preparing for disaster response. Drought, in combination with other stressors, such as fire, can have an adverse effect on habitat quality for Covered Species. Drought is an expected occurrence in Southern California, and measures will be taken to monitor the effects of drought, as defined above, on Covered Species, especially since the frequency of drought may increase due to climate change.

Preventive Measures

No measures are available to prevent climatic drought within the Covered Lands. Measures to ameliorate the effects of drought may involve providing artificial water sources for Covered Species adversely affected by drought.

Planned Response to Drought

If a climatic drought occurs within the TU MSHCP Covered Lands as defined by this section, the Permittees will notify USFWS of this changed circumstance, or USFWS may notify the Permittees. The Permittees will ensure that the damage caused by the drought is assessed and ensure initiation of the following actions:

- Prepare a damage assessment report.
- Recommend actions to ameliorate the effects of the climatic drought on Covered Species; such actions may include provision of temporary artificial water sources, such as wildlife guzzlers, for the benefit of Covered Species adversely affected by drought. In addition, elements of fuel management plans associated with Covered Activities that address wildfire management may be implemented to address adverse effects on Covered Species due to drought either by minimizing the risk of wildfire or by contributing to recovery from wildfire.
- Implement measures through Adaptive Management, which could include focused implementation of elements of minimization and mitigation measures incorporated in the TU MSHCP, including the grazing management plan and the integrated pest management plan.

8.1.2 FIRE/CLIMATE CHANGE

Fires have historically occurred, and will continue to occur, naturally within Covered Lands. For the purpose of defining changed circumstances, fire frequency is an appropriate metric to consider. Short-interval return fires (those occurring with greater frequency in the same location than indicated by historic records) are regarded as a changed circumstance.

Risk Assessment

Wildland fire is a natural occurrence within Covered Lands, and vegetation communities within Covered Lands are adapted to fire. The frequency of fire within Covered Lands may increase due to increased human presence associated with Covered Activities as well as due to drought associated with climate change.

Preventive Measures

For specific types of fire that are damaging to biological resources within the Covered Lands, the cause of the fire will be reviewed and preventive measures such as the following will be developed:

- Redesign, reconfigure, and/or review fuel breaks
- Work with local fire agencies to improve fire suppression preparedness

- Develop a public education program
- Contact firefighting authorities to identify appropriate strategies to fight fires to minimize habitat damage.

Planned Response to Fire

If an increase in fire frequency occurs within the Covered Lands as defined above, the Permittees will notify USFWS of this changed circumstance, or USFWS may notify the Permittees. The Permittees will ensure that the damage caused by the fire is assessed and will ensure initiation of the following actions:

- Develop and implement a monitoring program to monitor natural re-growth within the damaged area for an appropriate period
- If it is determined that natural re-growth is not occurring and that such absence of natural re-growth will adversely affect Covered Species, an action plan will be developed and implemented; the action plan will involve efforts to improve habitat conditions, including potentially reseeding burned areas with native plant species
- Implement response measures through Adaptive Management.

8.1.3 NEW LISTINGS OF SPECIES/DESIGNATION OF CRITICAL HABITAT NOT COVERED BY THE TU MSHCP

USFWS may list additional species under the Federal Endangered Species Act (FESA) as threatened or endangered, delist species that are currently listed, or declare listed species as extinct or designate new critical habitat. In the event of a new listing of one or more species not covered by the TU MSHCP, or designation of new critical habitat on the Covered Lands, USFWS and the Permittee(s) will identify actions that may cause take, jeopardy, or adverse modification of critical habitat, and the Permittee will avoid such actions in the implementation of its Covered Activities until approval of an amendment to the TU MSHCP to address the newly listed species has been obtained in accordance with the modifications and amendments procedures described in Section 8.4, Amendments. Such avoidance measures will include the following:

- Evaluation of applications for Covered Activities with respect to potential effects on the newly listed species or newly designated critical habitat; such evaluations will include assessment of the presence of suitable habitat for the newly listed species within the areas potentially affected by the proposed Covered Activity and surveys for the newly listed species, as appropriate, using accepted protocols.
- Implementation of measures to avoid impacts to the newly listed species and/or adverse modification to critical habitat based on the results of the data collected in the previous

item and the evaluation of those data in the context of the design of the proposed Covered Activity.

- If a new species that is not covered by the TU MSHCP but that may be affected by Covered Activities is listed under FESA during the term of the ITP, it will be reevaluated by USFWS and the Covered Activities may be modified, as necessary, to ensure that the activities covered under the TU MSHCP are not likely to jeopardize or result in the take of the newly listed species or cause adverse modification of any newly designated critical habitat. The Permittees shall implement the modifications to the Covered Activities identified by USFWS as necessary to avoid the likelihood of jeopardy to or take of the newly listed species or adverse modification of newly designated critical habitat. The Permittees shall continue to implement such modifications until such time as the Permittee has applied for and USFWS has approved an amendment of the ITP, in accordance with applicable statutory and regulatory requirements, to cover the newly listed species or until USFWS notifies the Permittees in writing that the modifications to the Covered Activities are no longer required to avoid the likelihood of jeopardy of the newly listed species or adverse modification of newly designated critical habitat.

8.2 UNFORESEEN CIRCUMSTANCES

Unforeseen circumstances are defined in 50 CFR 17.3 as changes in circumstances that affect a species or geographic area covered by the TU MSHCP that could not reasonably be anticipated by Permittees and USFWS at the time of the TU MSHCP's negotiation and development, and that result in a substantial and adverse change in status of the Covered Species. The purpose of the "No Surprises Rule" is to provide assurances to non-Federal landowners participating in habitat conservation planning under FESA that no additional land restrictions or financial compensation beyond that provided under the conservation plan will be required for species adequately covered by a properly implemented TU MSHCP, in light of unforeseen circumstances, without the consent of the Permittee.

In case of an unforeseen event, the Permittee shall immediately notify USFWS staff who have functioned as or remain the principal contacts for the proposed action. In determining whether such an event constitutes an unforeseen circumstance, USFWS shall consider, but not be limited to, the following factors: size of the current range of the affected species; percentage of range adversely affected by the TU MSHCP; percentage of range conserved by the TU MSHCP; ecological significance of that portion of the range affected by the TU MSHCP; level of knowledge about the affected species and the degree of specificity of the species' conservation program under the TU MSHCP; and whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

If USFWS determines that additional conservation and mitigation measures are necessary to respond to the unforeseen circumstances where the TU MSHCP is being properly implemented, the additional measures required of the Permittee must be as close as possible to the terms of the original TU MSHCP and must be limited to modifications within any conserved habitat area or to adjustments within lands or waters that are already set aside in the TU MSHCP's operating conservation program. Additional conservation and mitigation measures shall involve the commitment of additional land or financial compensation or restrictions on the use of land or other natural resources otherwise available for development or use under original terms of the TU MSHCP only with the consent of the Permittee.

8.3 RECONCILIATION OF THE 'NO SURPRISES RULE,' UNFORESEEN CIRCUMSTANCES, AND ADAPTIVE MANAGEMENT IN THE TU MSHCP

The "No Surprises Rule" states, in part, that in negotiating unforeseen circumstances, USFWS shall not require, without the consent of the Permittee, the commitment of additional land, water, or financial compensation or additional restrictions on the use of land, water (including quantity and timing of delivery), or other natural resources beyond the level otherwise agreed upon for the species covered by the conservation plan (50 CFR 17.32(b)(5)(iii)(A)).

If additional conservation and mitigation measures are deemed necessary to respond to unforeseen circumstances, USFWS may require additional measures of the Permittee where the conservation plan is being properly implemented, but only if such measures are limited to modifications within open space or to the conservation plan's operating conservation program for the affected species, and maintain the original terms of the conservation plan to the maximum extent possible. Additional conservation and mitigation measures shall not involve the commitment of additional land, water, or financial compensation or restrictions on the use of land, water (including quantity and timing of delivery), or other natural resources otherwise available for development or use under the original terms of the conservation plan without the consent of the Permittee (50 CFR 17.32(b)(5)(iii)(B)).

Thus, in the event that unforeseen circumstances adversely affect any of the Covered Species during the life of the TU MSHCP, the Permittee would not be required to provide additional financial compensation, land, or land restrictions beyond those required by the TU MSHCP at the time of issuance of the ITP without its consent. This prohibition does not, however, affect the requirements for responding to changed circumstances as described in Section 8.1.

In light of the TU MSHCP's Adaptive Management Program, which allows certain changes to occur throughout the life of the TU MSHCP, it is necessary to clarify which aspects of the conservation program are subject to the "No Surprises Rule" and for which, therefore, USFWS may not require additional mitigation as a result of unforeseen circumstances without the consent of the Permittee. The Adaptive Management Program allows the TU MSHCP to be revised as a result of new information on the life history or ecology of Covered Species generated through continuing research or information on the effectiveness of mitigation measures, and as a result of the monitoring programs. This would not constitute additional mitigation as a result of unforeseen circumstances. As noted in *Section 7, Conservation Plan for Other Covered Species*, of this TU MSHCP, depending on specific adaptive management measures implemented, adaptive management measures may require minor modification to the TU MSHCP.

8.4 AMENDMENTS

8.4.1 MINOR MODIFICATIONS

Minor modifications are changes that do not affect the scope of the TU MSHCP's impact and conservation strategy, change amount of take, add new species, or change significantly the boundaries of the TU MSHCP. Examples of minor modifications include correction of spelling errors or minor corrections in boundary descriptions. The Implementing Agreement, included as *Appendix C*, describes the process for approving minor modifications to the plan.

8.4.2 AMENDMENTS

Amendments to the TU MSHCP are changes other than minor modifications and will require an ITP amendment.

8.5 SUSPENSION/REVOCATION

The Implementing Agreement, included as *Appendix C*, describes the process for suspension/revocation of the ITP.

8.6 RENEWAL OF THE SECTION 10(A)(1)(B) PERMIT

The Implementing Agreement, included as *Appendix C*, describes the process for renewal of the ITP.

8.7 PERMIT TRANSFER

The Implementing Agreement, included as *Appendix C*, describes the process for transfer of the ITP.

8.8 OTHER MEASURES AS REQUIRED BY DIRECTOR

The Implementing Agreement, included as *Appendix C* to the TU MSHCP, further specifies the roles and responsibilities that have been developed to ensure compliance with the permit. In the event of a direct conflict between the TU MSHCP and the Implementing Agreement, the Implementing Agreement overrides.

9. FUNDING

As described in this Tehachapi Uplands Multiple Species Habitat Conservation Plan (TU MSHCP), the primary conservation strategy for Covered Lands is the preservation of approximately 91% of Covered Lands in open space in a configuration that benefits Covered Species. Preservation and stewardship of those lands with management practices that have been in place for over 100 years as part of ongoing ranching activities, along with the conservation measures provided in *Sections 4* and *7*, will benefit Covered Species and represent the key contribution by the permittees to this TU MSHCP. To demonstrate conservation and protection of the open space lands, Tejon Ranchcorp (TRC) will develop a tracking system to record all additions to the open space preserve, including placement of conservation easements on open space lands. Open space assembly tracking will be included in the annual reporting on the TU MSHCP described in *Section 7.3.1* and will include both annual and cumulative tracking for open space assembly. Cost estimates for implementing the TU MSHCP are presented in *Tables 9-1* and *9-2*.

Funding Assurances

TRC commits to fully fund its obligations under the TU MSHCP. TRC further understands that any failure to implement all of its duties under this TU MSHCP for any reason, funding considerations or otherwise, could result in violation of the Incidental Take Permit (ITP); enforcement action, including penalties under Federal Endangered Species Act Section 9 and Section 11; and suspension or revocation of the ITP. Execution of the Implementing Agreement by TRC and acceptance of the ITP will be authorized by resolutions that acknowledge TRC's responsibility for and duty to expend all sums contemplated and necessary to implement TRC's obligations under this TU MSHCP. The resolutions will also provide for annual certifications by TRC's Chief Financial Officer (CFO), or equivalent officer, to the effect that such funds have been budgeted and approved by all necessary corporate action.

TRC follows a zero-based budgeting concept. Zero-based budgeting is a process in which all expenditures must be justified each new period. Each department or division justifies its funding each year. That is, funding begins at a base of zero, and the department or division shows why its funding need efficiently helps the company meet its long-term and short-term business objectives. The budgeting process lasts approximately 2 months. During the budget process, department and division operating budgets and capital investment budgets are reviewed and approved by senior management. After senior management has internally approved the new annual budget, a budget book and presentation is prepared for the Tejon Ranch Company's Board of Directors, the publicly traded parent company of TRC. The Board of Directors reviews the budget each December and approves the TRC budget at the December Board of Directors meeting. Approval of the budget by the Tejon Ranch Company's Board of Directors gives TRC management the authority to carry out the activities within the new budget. Each year, following the adoption of TRC's corporate budget in December and prior to the start of TRC's new fiscal year, TRC's CFO, or equivalent officer, will deliver certification to the U.S. Fish and Wildlife Service (USFWS) that funds required of TRC to perform its duties under this TU MSHCP have been authorized and are available.

TRC will provide separate, segregated financial assurance adequate to fund all mitigation measures related to incidental take set forth in this TU MSHCP. Funding for care and translocation of habituated condors (see *Table 9-1*), should the need arise, will be paid for through a reimbursable agreement with USFWS, and assured through a rolling letter of credit from TRC, which must be renewed annually not less than 30 days prior to its expiration date, or other security approved by USFWS. Funding for operational costs (see *Tables 9-1* and *9-2*) will be assured through annual certification by TRC's CFO, or equivalent, to the effect that funds have been budgeted to provide the staffing necessary to carry out operational requirements. Each year, following adoption of TRC's corporate budget by the Tejon Ranch Company's Board of Directors in December and prior to the start of its new fiscal year on January 1, TRC's CFO or equivalent will deliver to USFWS a budget and scope of work outlining all components of the TU MSHCP to be implemented during the fiscal year, accompanied by a certification that the funds required of TRC to perform duties under the TU MSHCP have been authorized and are available, with a link to the company's 10-K report. Thus, there is no expectation under this TU MSHCP that TRC's current financial resources or budget would be unable to satisfy the costs of implementing the TU MSHCP.

TRC and the Tejon Ranch Company receive revenue from a variety of sources, including but not limited to land sales, oil and gas revenues, filming, hunting, and agriculture. As of March 31, 2011, total capitalization of the Tejon Ranch Company was $287,085,000, consisting of only $317,000 of debt and $286,768,000 of equity, which results in a debt-to-total-capitalization ratio of less than 1%. As of March 31, 2011, the Tejon Ranch Company had $86,840,000 in cash and securities and $30,000,000 available on credit lines to meet any short-term liquidity needs. The Tejon Ranch Company has a long-term revolving line of credit of $30,000,000 that, as of March 31, 2011, had no outstanding balance. The Tejon Ranch Company's current assets of $101,057,000 significantly exceed current liabilities of $9,142,000.

Based on these assets, the Tejon Ranch Company (and thereby TRC) has ample funds to implement its TU MSHCP responsibilities for the life of the ITP term.

Indeed, evidence of the sufficiency of the TRC funding source is provided in public reporting documents. Specifically, the Tejon Ranch Company prepares and issues an annual report in April of each year that includes financial results and an overview of the company's operations for the prior year (including for TRC, its wholly owned subsidiary). In addition, the Tejon Ranch Company is required to file an annual report on form 10-K and quarterly reports on form 10-P with the U.S. Securities and Exchange Commission (SEC). The report is posted on the Tejon Ranch Company's website concurrently with the SEC filing and covers TRC.

TRC recognizes that inflation will likely cause changes in the estimated costs of implementation of this TU MSHCP over the life of the permit. TRC commits to meeting all costs identified in this TU MSHCP, regardless of these changes.

Cost Assumptions

Cost assumptions for implementing the TU MSHCP, where appropriate, are included in *Tables 9-1* and *9-2*.

Table 9-1. Estimated Costs for Care and Translocation of California Condor Associated with Potential Take

Action	Species	Annual Cost per Bird[1, 2]
Care for California Condor		
Costs typical for care of each bird	Condor	$8,100
One-time cost for each bird	Condor	$403
USFWS assistance in capturing and transporting injured condor	Condor	$1,375
Condor Translocation Cost	*Condor*	*$75,634*
Total California Condor Care and Translocation		**$85,512**

Note:
[1] In the event a take occurs and the USFWS revokes the ITP, TRC will fund the cost of the care and translocation of up to four condors for up to six 6 years beyond the revocation date.
[2] The ITP allows for non-lethal take of up to four condors.

Table 9-2. Estimated Operational Costs for Monitoring for Covered Species

Action	Species	Assumptions /Notes	One-Time Cost	Annual Cost
Full-Time Biologist[1]				
Tejon Staff Biologist	—	1 biologist	—	$136,000
Equipment and supplies for Tejon Staff Biologist	—	Equipment and supplies will generally include field and monitoring supplies as well as vehicle use and maintenance.	—	$94,000
Pre-activity surveys for Covered Activities not related to commercial and residential construction will be conducted.	Suitable Habitat	Western spadefoot and American peregrine falcon		$26,000
Environmental baseline surveys of open space	All	—	$52,000	—
Changed Circumstances	—	—	—	$37,000

Table 9-2 (Continued)

Action	Species	Assumptions /Notes	One-Time Cost	Annual Cost
Adaptive Management	—	—	—	$37,000
Consulting Contingencies	—	—	—	$52,000
Subtotal Full-Time Biologist			*$52,000*	*$382,000*
Avoidance and Minimization				
Surveys will be conducted in suitable habitat prior to grading.	All	Species to be surveyed will depend upon habitat suitability.	—	—
Construction activities in modeled suitable habitat will be monitored.	All	—	—	—
Grazing management plan (implementation and monitoring)	All	—	—	—
Preferred diurnal perches and roosting areas will be mapped and avoided. Management standards and setbacks will be applied to preferred diurnal perches and high-quality roost trees.	Bald eagle	—	—	—
Signage adjacent to Castac Lake will be installed indicating that feeding bald eagles is prohibited and indicating that prohibitions will be enforceable against all residents and guests.	Bald eagle	—	—	—
Interpretive and educational signage will be installed at Castac Lake, informing the public about bald eagles, their habitat requirements, and their sensitivity to human disturbance during the wintering season for the species (late October through March).	Bald eagle	—	—	—
If nesting individuals are found during surveys conducted prior to grading, setbacks must be implemented. Submit results of surveys and relocation efforts to California Department of Fish and Game.	Burrowing owl	—	—	—
If active golden eagle nest sites (primary or alternate) are observed on site during a survey, a nest-specific analysis will be prepared to identify the primary nest and establish its viewshed (the "Viewshed"). A complete viewshed analysis will be conducted for the primary nests determined to be in active use and design and development restrictions will be implemented to avoid/minimize disturbance to active primary nests.	Golden eagle	—	—	—
Surveys for breeding birds will be conducted for construction activities scheduled for the breeding season in or immediately adjacent to breeding habitat.	All avian Covered Species and native birds	—	—	—

Table 9-2 (Continued)

Action	Species	Assumptions /Notes	One-Time Cost	Annual Cost
For occupied bird nests, the Tejon Staff Biologist will establish appropriate buffers for active nests detected during surveys conducted prior to grading, in compliance with applicable regulatory protocols. Active nests and designated buffers will be shown on appropriate planning maps. Construction within the buffers will be avoided until the nests are abandoned or until the young have fledged or have been reared.	All native avian species		—	—
European starling monitoring, removal, and management methods will be implemented if determined necessary by the Tejon Staff Biologist.	Purple martin	—	—	—
Prior to implementation of starling management measures, the Tejon Staff Biologist will develop a management plan.	Purple martin	—	—	—
At the discretion of the Tejon Staff Biologist, during surveys conducted prior to grading, relocation of observed individuals may be undertaken consistent with the appropriate scientific collection permits; all handling of amphibians shall be conducted in accordance with the fieldwork code of practice developed by the Declining Amphibian Populations Task Force (DAPTF 2009).	All amphibians and reptiles	—	—	—
At the discretion of the Tejon Staff Biologist, a live-trapping program will be conducted for Tehachapi pocket mouse in suitable habitat in the project disturbance zone and within 100 feet of disturbance zone no earlier than 7 days prior to commencement of activities resulting in permanent ground disturbance. In order to minimize direct impacts to individuals to the extent feasible, prior to grading a trapping program would be conducted for 5 nights in suitable habitat to trap and salvage as many individuals as possible from the disturbance zone and release them in suitable habitat away from the project disturbance zone.	Tehachapi pocket mouse	—	—	—
If construction for development activities is proposed within 325 feet of Tehachapi buckwheat occurrences, the Tejon Staff Biologist will perform weekly construction monitoring. The monitoring tasks will include reviewing and approving protective fencing, dust control measures, and erosion control devices before construction work begins; conducting a contractor education session at the preconstruction meeting; and reviewing the site weekly (minimum) during construction to ensure the fencing, dust control, and best management practice measures are in place and functioning correctly and that work is not directly or indirectly impacting the plants. Monitoring reports will include remedial recommendations and issue resolution discussions when necessary.	Tehachapi buckwheat	—	—	—

Table 9-2 (Continued)

Action	Species	Assumptions /Notes	One-Time Cost	Annual Cost
Establishment of setbacks in design features of development and map them to protect species. Lighting adjacent or near open space will be directed away from open space.	All	—	—	—
Management and planning of activities in open space shall incorporate the final baseline surveys required per Section 7.3.2.	All	—	—	—
Conduct surveys in suitable habitat areas for fully protected species and Tehachapi buckwheat prior to grading.	All fully protected Covered Species, and Tehachapi buckwheat	Species to be surveyed will depend upon habitat suitability. Any fully protected species and/or active bird nests will be avoided; other species may be trapped and relocated.	—	—
For fully protected species, the Tejon Staff Biologist will monitor construction activities to ensure avoidance of any harm to individuals and will have the authority to direct the cessation of field activities likely to cause any such harm.	All fully protected species	—	—	—
Implement contractor/construction personnel meetings with educational information about TU MSHCP requirements and Covered Species prior to grading.	All	—	—	—
Fence or flag disturbance/grading perimeters to identify extent of authorized disturbance areas and boundary of non-disturbance areas.	All	—	—	—
Implement best management practices to protect surface water quality (pollutants, erosion, dust control, sedimentation) during construction in compliance with Clean Water Act and Porter-Cologne requirements.	All	—	—	—
Covenants, conditions, and restrictions for each parcel will prohibit the feeding of the California condor, the bald eagle, and other wildlife species.	All	—	—	—
Homeowners' association(s), TRC guests, contractors and licensees, and public visitors will be provided with educational information regarding the Covered Species and acceptable recreational activities, pet restrictions, and wildlife restrictions in open space areas.	All	—	—	—
An integrated pest management plan will be developed and implemented (including measures to control and eradicate non-native, invasive species including bullfrogs and Argentine ant) in conjunction with development,	All	—	—	—

Table 9-2 (Continued)

Action	Species	Assumptions /Notes	One-Time Cost	Annual Cost
ranchwide operations, and management of open space.				
The installation of infrastructure (and trails) or other permanent ground-disturbing activity within open space will include efforts to minimize the footprint and use best management practices for the design and installation of any such infrastructure, including surveys prior to grading, contractor education, staking, and temporary construction fencing.	All	—	—	—
Selection of any new public access trails shall be made in consultation with the Tejon Staff Biologist and the selection of appropriate locations for access, trails, and facilities will minimize impacts to the open space areas.	All	—	—	—
Subtotal Avoidance and Minimization			—	—
Mitigation and Recovery				
USFWS technical assistance reimbursement	Condor and Other Covered Species	—	—	$21,000
Establishment and enforcement of a perpetual ranchwide ban on lead ammunition	Condor and Other Covered Species	—	—	
Funding for additional GPS transmitters	Condor	—	$156,000	$26,000/year for ten years
Establishment of 93,522 acres of Established Open Space and 23,001 acres of TMV Planning Area Open Space as mitigation (in perpetuity)	All	—	—	—
Ranchwide Management Plan to help preserve, protect, and enhance the conservation values of the open space areas of Tejon Ranch, and to help facilitate public access and educational programs	All	—	—	—
Subtotal Mitigation			*$156,000*	*$47,000 (plus $26,000/year for nine additional years)*
Monitoring and Reporting				
Compliance monitoring: tracking take cumulatively for each species during the permit term	All	—	—	—
Compliance monitoring: tracking lands added to open space	All	—	—	—
Compliance monitoring: tracking of funds expended for habitat management and species conservation	All	—	—	—
TU MSHCP Annual Reports	—	—	—	—
Subtotal Monitoring and Reporting			—	—

Table 9-2 (Continued)

Action	Species	Assumptions /Notes	One-Time Cost	Annual Cost
Changed Circumstances				
Response to Climate Change/Drought: *Damage caused by climate change will be assessed and the following actions initiated:* • Prepare a damage assessment report • Recommend actions to ameliorate the effects of the climatic change on Covered Species • Implement measures through adaptive management.	—	—	—	—
Response to Climate Change/Fire: • *Redesign, reconfigure, and/or review fuel breaks* • *Work with local fire agencies to improve fire suppression preparedness* • *Develop a public education program* • *Develop effective exotic plant control tools* • *Contact firefighting authorities to identify appropriate strategies to fight fires to minimize habitat damage* • *Develop and implement a monitoring program to monitor natural regrowth within the damage area for an appropriate period* • *If it is determined that natural regrowth is not occurring and that such absence of natural regrowth will adversely affect Covered Species, an action plan will be developed and implemented; the action plan will involve efforts to improve habitat conditions* • *Implement response measures through adaptive management.*	—	—	—	—
Response to a listing of a new species/designation of critical habitat not covered by the TU MSHCP	—	—	—	—
Subtotal Changed Circumstances			—	—[2]
Total TU MSHCP Implementation Operational Costs			**$208,000**	**$429,000**

Note:

[1] The Tejon Staff Biologist will be responsible for implementing the avoidance, minimization, mitigation, and monitoring measures described in *Table 9-2*.

[2] Costs for changed circumstances and adaptive management are included above under Tejon Staff Biologist Costs.

10. ALTERNATIVES

10.1 SUMMARY

As required by Federal Endangered Species Act (FESA) Section 10(a)(2)(A), this section of the Tehachapi Uplands Multiple Species Habitat Conservation Plan (TU MSHCP) analyzes alternatives considered by Tejon Ranchcorp (TRC). This section describes and analyzes four alternatives: a No Action Alternative, the Proposed TU MSHCP Alternative, a Condor Only HCP Alternative, and a Kern County General Plan Buildout Alternative.

All of the alternatives would encompass the same 141,886 acres of the Covered Lands, including the approximately 37,100-acre Tunis and Winters Ridge area, which is designated as the Condor Study Area. The Condor Study Area includes high-value California condor (*Gymnogyps californianus*) habitat and areas of historically frequent condor foraging and roosting activity within the ranch, based on telemetry and observational data.

The following existing ranch uses (which also form the basis of the Covered Activities in the Proposed TU MSHCP Alternative and the Condor Only HCP Alternative) would occur for all alternatives: livestock grazing and management; fuel management; film production; private recreation; farming and irrigation water diversion activities; repair, maintenance, and use of roads (including relocation and construction of dirt roads as needed); maintenance of utilities; use, maintenance, and relocation of back-country cabins; use, maintenance, and construction of ancillary ranch facilities; maintenance and construction of fences; and use, repair, and maintenance of the existing TRC headquarters buildings and other structures in the Lebec/Existing Headquarters Area. These activities are current and ongoing at the present time and reflect current conditions within Covered Lands.

None of the alternatives include hunting as a Covered Activity. The commercial hunting program at the ranch, which is regulated by the California Department of Fish and Game (CDFG), is anticipated to continue throughout the ranch; no take of any Federally protected species is authorized, and the hunting program must continue to be managed to avoid the take of any Federally protected species. TRC banned the use of lead ammunition on its lands effective January 1, 2008. The ban applies to all hunters registering with TRC's Wildlife Management Operation for hunting access licenses. The "Private Wildlands Habitat Enhancement and Management Area License" issued to TRC by CDFG also includes a provision relating to the lead-use ban. The ban also applies to all TRC employees or third parties who are engaged in any animal damage control or nuisance abatement activities on the ranch. This ban is assumed to occur in each of the alternatives and would be implemented and enforced by TRC through the issuance of hunting permits and by the execution of the "Notice, Acknowledgement and Agreement Relating to the Lead Ammunition Ban and the Protection of the California Condor" and "Hunting Rules and Regulations" by all hunters on ranch property. Examples of the lead-ban documents used by TRC are included as *Appendix E* to the MSHCP. A lead ammunition ban was also recently adopted for the condor's historic range by the State of California and applies only to hunting activities (California Fish and Game Code, Section 3004.5).

None of the alternatives include mineral extraction as a Covered Activity. Mineral extraction is a current use (the existing National Cement and La Liebre mines) and Mineral and Petroleum areas are designated in the Kern County General Plan. In each of the alternatives, only these current mining uses are presumed to continue.

None of the alternatives include the construction or operation of the Veterans Administration (VA) Cemetery as a Covered Activity. TRC donated approximately 500 acres of the ranch to the VA for development of a cemetery for veterans. Approximately 384 acres of this cemetery site are located in the Covered Lands. The VA prepared an environmental assessment for the construction and operation of the VA Cemetery, which resulted in a finding of no significance under the National Environmental Policy Act (URS 2007). For all alternatives, the VA Cemetery is assumed to be completed as planned by the VA and no commercial or residential development is assumed to occur in the area.

Finally, the Ranchwide Agreement (*Appendix A*), which was executed in June 2008 by several major environmental organizations, including the National Audubon Society, the Sierra Club, the Natural Resources Defense Council, the Endangered Habitats League, and the Planning and Conservation League (collectively known as the Resource Groups); the Tejon Ranch Conservancy; and TRC, is currently in place. It precludes development in certain areas of the ranch for a minimum of 99 years; ultimately, it is anticipated that a series of conservation easements will be recorded and will protect those areas in perpetuity. Most of the conservation easements are triggered by development approvals (e.g., final approval of the TMV Project, including successful resolution of all lawsuit appeals), and none of those triggers have been met. As noted, to date, the option provided to the California Wildlife Conservation Board to purchase conservation easements over certain areas of the Covered Lands totaling 12,795 acres was exercised and conservation easements were recorded in December 2010 (Existing Conservation Easement Areas). Because the Ranchwide Agreement is a private agreement to which the U.S. Fish and Wildlife Service (USFWS) is not a party, it cannot be assured that the agreement would not be amended or terminated, or that the remaining conservation easements would ultimately be recorded. Therefore, one alternative, the Kern County General Plan Buildout Alternative, presents a scenario where the Ranchwide Agreement protections would not exist, except for the permanent protection of the already recorded conservation easements on the Existing Conservation Easement Areas.

The primary differences between the four alternatives are the level of conservation planning and USFWS management, as well as the intensity and location of development and the extent of permanently preserved open space areas. A brief description and analysis of each of the alternatives is provided below.

10.2 NO ACTION ALTERNATIVE

The No Action Alternative assumes that the proposed issuance of an Incidental Take Permit (ITP) would not occur. Under the No Action Alternative, it is assumed that the Ranchwide Agreement remains in effect, that development of the TMV Project and other future commercial or residential development allowed within the Covered Lands would not occur, and that existing ranch uses would continue at current levels into the future. The conditions of approval for the TMV Project by Kern County identify certain actions to be undertaken by USFWS, including directing the potential operation of a supplemental feeding program and capturing condors that have become habituated. The No Action Alternative does not assume future action on the part of USFWS, including future USFWS action identified as a condition of approval of the TMV Project. It is assumed USFWS would continue to provide technical assistance to TRC regarding the California condor.

Approximately 106,317 acres of open space would be preserved from development under this alternative for at least 99 years, including 93,522 acres in the Established Open Space Area. The 12,795 acres of Existing Conservation Easement Areas would be preserved in perpetuity as required by the Ranchwide Agreement. If there is no TMV Project development, then the requirement to permanently preserve open space in the TMV Planning Area is not triggered. Additionally, if there is no development approved (either the TMV Project or the Centennial or Grapevine projects, which are contemplated by the Ranchwide Agreement, but located outside the Covered Lands), then the conservation easements (other than the Existing Conservation Easement Areas) would not be recorded and the Tejon Ranch Conservancy would not receive full funding to effectuate permanent protection and management of the conservation easement areas. No commercial or residential development is anticipated to occur under this alternative.

Existing ranch uses under the No Action Alternative are generally assumed to continue at current levels and to avoid take of listed species. Those activities that are limited by the requirements of the Ranchwide Agreement as discussed in *Section 2, Plan Description and Activities Covered by Permit*, are generally coextensive with the Plan-Wide Activities[1] described in *Section 2* and include the following:

- Livestock grazing and range management activities
- Fuel management
- Filming

[1] Existing ranch uses differ from the Plan-Wide Activities described in TU MSHCP *Section 2* in that (a) private recreation is expanded to include public access as a Plan-Wide Activity, (b) mitigation, monitoring, and management activities are included as a Plan-Wide Activity, and (c) any commercial and residential development activities in open space—generally limited to emergency vehicle access, outside the development envelope, if needed—would be limited by the 200-acre overall Plan-Wide Activity limit.

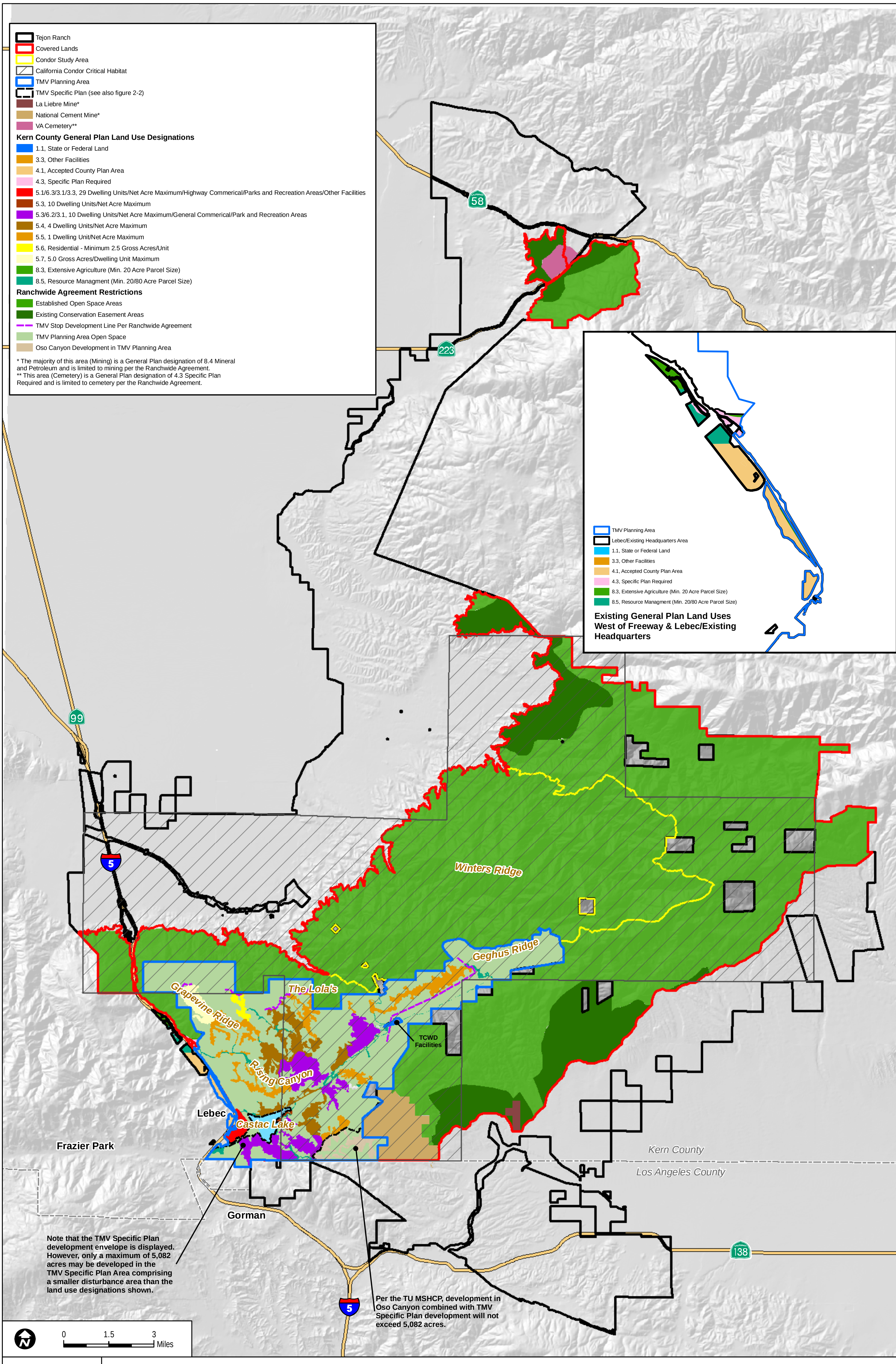
- Private recreation
- Farming irrigation and water diversion systems
- Roads
- Utilities
- Back-country cabins
- Ancillary ranch structures
- Fencing.

This alternative reflects existing conditions and forms the basis of comparison to the other alternatives. No take of Covered Species would occur under this alternative.

10.3 PROPOSED TU MSHCP ALTERNATIVE

The Proposed TU MSHCP Alternative (see *Figure 10-1*, *Proposed TU MSHCP & Condor Only HCP Alternative*) assumes that an ITP will be issued for all Covered Species and Covered Activities on Covered Lands, and that the Ranchwide Agreement would be fully implemented. No development would occur within the Condor Study Area, and approximately 116,523 acres (approximately 82%) of the Covered Lands would be permanently precluded from development as mitigation land, and pursuant to the Ranchwide Agreement, the additional 12,795 acres of Existing Conservation Easement Areas would also be permanently protected. In total, approximately 129,318 (91%) of the Covered Lands would be permanently preserved as open space under the Proposed TU MSHCP Alternative. Plan-Wide Activities, which include existing and foreseeable ranch uses, would continue throughout the Covered Lands as described in more detail in *Section 2*.

The development to be authorized under this alternative would occur in two locations of the Covered Lands that are adjacent to the Interstate 5 (I-5) corridor: the TMV Planning Area and the Lebec/Existing Headquarters Area.



SOURCE: TRC 2007

FIGURE 10-1

Proposed TU MSHCP & Condor Only HCP Alternative

Draft Tehachapi Uplands MSHCP

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The TMV Planning Area includes the TMV Specific Plan Area, Oso Canyon, and an area known as West of the Freeway. Together, development in the TMV Planning Area would include approximately 3,624 dwelling units and up to 464,920 square feet of commercial development within a total disturbance area of approximately 5,252 acres. In the TMV Planning Area, the TMV Specific Plan Area comprises the majority of the acreage and consists of the TMV Project, which was approved by Kern County, with the Specific Plan and corresponding General Plan amendments, and an environmental impact report (the Tejon Mountain Village Final Environmental Impact Report), in October of 2009. Under the Proposed TU MSHCP Alternative, no development is currently proposed in Oso Canyon, but if development were to proceed there, the total disturbance area in the TMV Planning Area could not increase. Development in West of the Freeway area is assumed to proceed consistent with the current General Plan designations.

The Lebec/Existing Headquarters Area is an approximately 410-acre area around the existing ranch headquarters located near Fort Tejon, also adjacent to and on both sides of I-5. Although no development plans currently exist for the 410-acre Lebec/Existing Headquarters Area, the Proposed TU MSHCP Alternative assumes current General Plan designations, which would allow for up to nine additional dwelling units and 1,339,470 square feet of commercial development.

The total amount of Covered Activity development that would occur in both the TMV Planning Area and the Lebec/Existing Headquarters Area under the Proposed TU MSHCP Alternative includes 3,632 dwelling units and 1,804,390 square feet of commercial development.

Under the Proposed TU MSHCP Alternative, approximately 5,533 acres of the Covered Lands (approximately 4%) would be disturbed by Development Activities within the TMV Planning Area and Lebec/Existing Headquarters Area.

Thus, the Proposed TU MSHCP Alternative would result in 4% more ground disturbance than the No Action Alternative and therefore, a higher level of impact to Covered Species. Additionally, while the No Action Alternative would result in no take of any listed species, the Proposed TU MSHCP Alternative would allow up to four non-lethal takes of California condor. Because the TU MSHCP incorporates the TMV Project, which allows for flexible siting of a permanent 5,082-acre disturbance area within a 7,860-acre development envelope, and because Oso Canyon development has not been proposed, but per the Ranchwide Agreement may occur within a 506-acre development envelope, the TU MSHCP analyzes a 8,817-acre development envelope, rather than the 5,533-acre disturbance area for purposes of the biological analysis. Thus, in assuming 100% impact of the 8,817-acre development envelope, the TU MSHCP analysis overstates the potential impact to Covered Species. As discussed in *Section 6*, *Potential Biological Impacts/Take Assessment*, the Proposed TU MSHCP Alternative would allow removal of modeled suitable habitat for the Covered Species presented in *Table 6-1*, *Conservation Goals and Impacts for Covered Species' Modeled Suitable Habitat within Covered Lands*. This would represent a higher level of take than in the No Action Alternative. The addition of public access and mitigation, monitoring, and management activities to Plan-Wide Activities is not expect to result in additional take due to the conservation measures provided in the TU MSHCP.

10.4 CONDOR ONLY HCP ALTERNATIVE

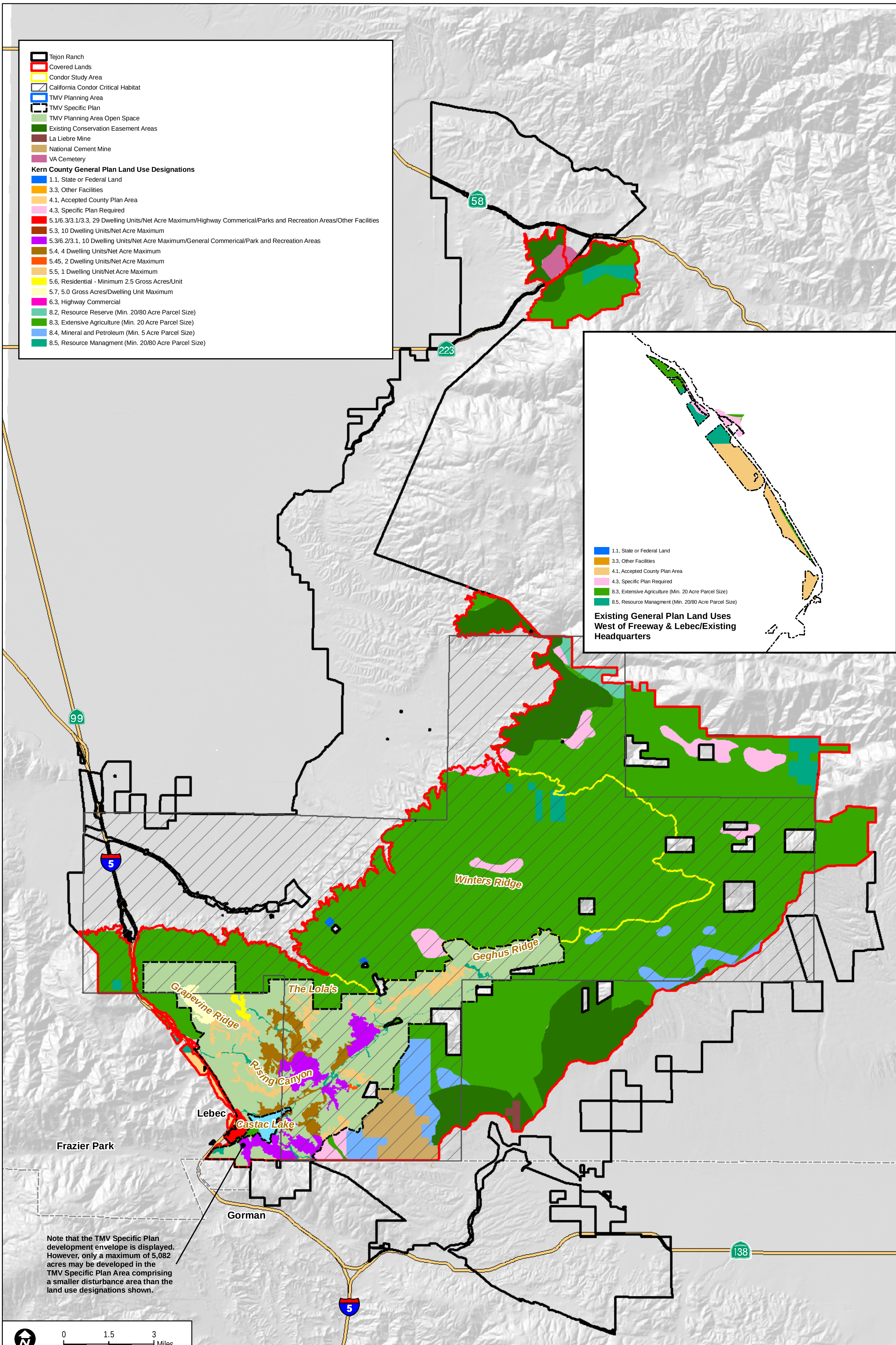
The Condor Only HCP Alternative (see *Figure 10-1*) would result in the issuance of an ITP covering only the California condor as originally proposed in 2004 and full implementation of the Ranchwide Agreement. This alternative would not include the comprehensive protective measures that would apply to all of the Covered Species in the Proposed TU MSHCP Alternative. The protection measures for the other Federally listed species would be determined as a result of project-specific review and approval processes triggered by applicant requests. The application of species-protection measures at a project-specific level would meet applicable legal requirements and is assumed to avoid take of other listed species but would not provide for the comprehensive level of resource planning and corresponding species-protection measures across the entire Covered Lands.

Development and open space preservation would be consistent with those elements described in the Proposed TU MSHCP Alternative. Covered Activities would also be the same as those described in the Proposed TU MSHCP Alternative, except that all management and mitigation elements would be limited to California condor–related measures. Similarly, the conservation measures and adaptive management elements of the habitat conservation plan would be limited solely to the California condor.

This alternative is also expected to result in up to four non-lethal takes of California condor. The ground disturbance impact, and therefore the impact to Covered Species from modeled suitable habitat loss, would be the same as considered in the Proposed TU MSHCP Alternative, and take of Other Covered Species would be avoided or mitigated on a project-by-project basis.

10.5 KERN COUNTY GENERAL PLAN BUILDOUT ALTERNATIVE

Under the Kern County General Plan Buildout Alternative (see *Figure 10-2*, *Kern County General Plan Buildout Alternative*), development is assumed to proceed in accordance with the Kern County General Plan on a project-by-project basis, including implementation of the TMV Project (as approved by Kern County in 2009). Development of the Covered Lands would require Kern County approval, and it assumed that USFWS would issue project-by-project incidental take authorization as appropriate through either FESA Section 7 or Section 10.



SOURCE: TRC 2007

FIGURE 10-2

Kern County General Plan Buildout Alternative

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Because the Ranchwide Agreement is a private agreement between parties, and USFWS is not a party to and has no contractual standing under the agreement, the agreement can be amended (or even terminated) by the parties such that the land preservation outcome of the Ranchwide Agreement on Covered Lands may not be realized. To date, the Ranchwide Agreement has resulted in the recordation of conservation easements on 12,795 acres of Covered Lands (Existing Conservation Easement Areas); however, the remainder of the Covered Lands to be precluded from development under this agreement do not currently have conservation easements recorded. Therefore, this alternative does not assume full implementation of the Ranchwide Agreement, and includes only the permanent protection of the already-recorded conservation easements on the Existing Conservation Easement Areas.

The Kern County General Plan Buildout Alternative would include approximately 34,130 acres of permanently preserved open space within the Covered Lands, including 12,795 acres of Existing Conservation Easement Areas and 21,335 acres of permanent open space required by the TMV Project Approvals.

Development under this alternative would result in approximately 7,238 dwelling units and 2,144,810 square feet of commercial development. The net development disturbance that would occur under the Kern County General Plan Buildout Alternative is 12,142 acres, or approximately 9% of the Covered Lands.

This alternative would result in 9% more ground disturbance than the No Action Alternative and 5% more ground disturbance than the Proposed TU MSHCP and Condor Only HCP Alternatives, and therefore, a higher level of impact to Covered Species. Because the exact boundaries of the TMV Project and other development are not known, to evaluate the potential impact to Covered Species, this alternative assumes impacts within a larger 14,934-acre development area; thus, this alternative would impact more acres of suitable habitat and would represent a higher level of take than in the No Action Alternative and the Proposed TU MSHCP/Condor Only HCP Alternatives. Lethal take of the California condor would be avoided, and it is anticipated that at least four non-lethal takes could similarly occur.

10.6 ALTERNATIVE SELECTED

The Proposed TU MSHCP Alternative is the selected alternative. It is the result of several years of planning and continued refinement of the appropriate land use and conservation approach for the Covered Lands. The Proposed TU MSHCP Alternative is designed primarily to preclude development on, and protect as open space in perpetuity, 116,523 acres (82%) of the Covered Lands (including the entirety of the Condor Study Area) as mitigation lands, for a total of 91% of the Covered Lands, including the Existing Conservation Easement Areas as protected through the Ranchwide Agreement. The Proposed TU MSHCP Alternative includes measures to further minimize and mitigate remaining impacts to the Covered Species and measures that contribute to Covered Species conservation and recovery as required by FESA.

While the No Action Alternative would result in no take (and therefore, less than considered in the Proposed TU MSHCP Alternative), it would not meet TRC's purpose and need in applying for an ITP under Section 10 of FESA since it would not include development. It would also not include some of the benefits to the Covered Species, including condor recovery measures, such as provision of GPS units, and monitoring, reporting, and adaptive management measures in the open space. Although the Condor Only HCP Alternative considers the same development footprint as the Proposed TU MSHCP Alternative, species management under the habitat conservation plan would be limited to the California condor, which could limit the protections afforded to other listed and special-status species that could be listed in the future. Finally, the Kern County General Plan Buildout Alternative would likely result in additional effects to Covered Species, since development would result in more permanent ground disturbance and would proceed on a project-by-project basis. Therefore, TRC has selected the Proposed TU MSHCP Alternative.

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